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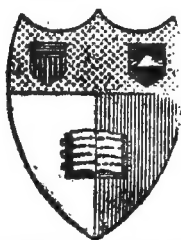
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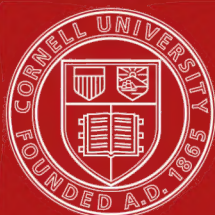


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I. D. 1209

A MANUAL OF
NETHERLANDS INDIA
(DUTCH EAST INDIES)

*Compiled by the Geographical Section of the Naval Intelligence
Division, Naval Staff, Admiralty*

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NOTE ON THE SPELLING OF PLACE-NAMES

In transliterating Malay names from Dutch it is only necessary to notice that Dutch *aa* = English *a* ; *aoe* or *auw* = *au* ; *dj* = *j* ; *j* = *y* ; *oe* = *u*. *Tj* should strictly be transliterated *ty*, and sometimes is so in this volume, but the sound closely approaches the English *ch*, and this, in the English transliteration of many names (e. g. Chilachap, not Tyilatyp), has become conventional. Dutch *w* generally = English *w*, but sometimes apparently *v*.

CHAPTER I

INTRODUCTION AND GENERAL SURVEY

The Malay Archipelago and the Dutch possessions—Area—Physical geography of the archipelago—Frontiers and adjacent territories—Lines of international communication—Dutch progress in Netherlands India (Relative importance of Java—Summary of economic development—Administrative and economic problems—Comments on Dutch administration).

THE MALAY ARCHIPELAGO AND THE DUTCH POSSESSIONS

NETHERLANDS INDIA, the Netherlands Indies, and the Dutch East Indies are names alternatively applied to the Dutch possessions in the Malay Archipelago, which the Dutch call *Nederlandsch-Indië* or *Nederlandsch-Oost-Indië*.

The Malay Archipelago, variously known as Malaysia, the East Indies, Indonesia, &c., is the vast congeries of islands which lie between south-eastern Asia and northern Australia. This archipelago is usually taken to include :

1. The Great Sunda Islands—Java, Sumatra, Borneo, and Celebes, with islands adjacent to them or lying between them.
2. The Philippine Islands.
3. The Moluccas. This name, in its wider application, includes all the islands between Celebes on the west, New Guinea on the east, and Timor on the south. These islands (apart from those which lie close to Celebes and are considered in Chapter II as geographically connected with it) fall into the following principal groups : (a) the Moluccas proper, or Ternate group, including Halmaheira ; (b) the Bachian, Sula, and Ombi or Obi groups ; (c) the Amboina groups, of which Ceram and Buru are the largest islands ; (d) the Banda Islands ; (e) the South-eastern Islands (Tenimber Islands), of which Timor Laut is the largest ; (f) the Kei and Aru Islands, of which the former are sometimes attached to the south-eastern group ; (g) the South-western Islands, or the Babar, Sermata, Letti, Damar, Roma, and Wetar groups.
4. New Guinea and adjacent islands.

5. The Lesser (or Little) Sunda Islands, which form a chain between the South-western Islands and Java, and include Timor, Flores, Sumba, Sumbawa, Lombok, and Bali, and islands between and adjacent to them.

Of the above, all are Dutch possessions except the northern part of Borneo (British), the Philippines (belonging to the United States of America), the eastern and northern parts of Timor (Portuguese), and the eastern part of New Guinea (British and formerly German).

Inasmuch as Java, though by no means the largest, contains Batavia, the capital, and is the administrative centre of Netherlands India, as well as economically the most important and by far the most populous island in the archipelago, the Dutch make a broad division of their territories into (a) Java (with the contiguous island of Madura), and (b) the Outer Possessions or Outposts (*Buitenbezittingen*). This division will be followed throughout this book. In those sections where separate treatment of the principal islands or groups is necessary an order will be followed, unless there is reason to the contrary, beginning with Java, following a geographical sequence westward to Sumatra, eastward through Borneo, Celebes, and the Moluccas to New Guinea, and finally completing the circuit westward through the Lesser Sunda chain.

AREA

The total land-area of Netherlands India is variously estimated, sometimes as low as 698,000 square miles, but 736,850 square miles seems to be a more probable approximate figure. According to this version the areas of the principal islands in square miles are as follows: Java, with Madura, 50,777; Sumatra, 167,954; the Dutch portion of Borneo, 222,850; Celebes, 71,400; the Dutch portion of New Guinea, 151,789. These figures leave a balance of 72,080 square miles for all the remaining islands.

The Dutch possessions lie on both sides of the Equator, principally south of it, for it passes through the centre of Sumatra and Borneo, the northern peninsula of Celebes, and the south of Halmaheira. Approximately the limits are from 6° N. off Sumatra to 11° 30' S. off Timor, and from 95° E. in Sumatra to 140° E. in New Guinea.

PHYSICAL GEOGRAPHY OF THE ARCHIPELAGO

In its physical aspect, which is reflected in its biological aspect also, the archipelago may be divided into three parts.

1. Southward from Burma and the Malay Peninsula a shallow submarine platform, over which the sea seldom exceeds a depth of 50 fathoms, extends south and south-east, and upon it stand Sumatra, Java, Borneo, and intervening islands. This platform is covered, in the north-western part, by the South China Sea, which communicates with the Indian Ocean (Bay of Bengal) by Singapore and other straits leading to Malacca Strait, between the Malay Peninsula and Sumatra. South-eastward the South China Sea communicates with Java Sea, between Java and Borneo, by Banka, Gaspar, and Karimata Straits; and Java Sea communicates with the Indian Ocean through Sunda Strait between Java and Sumatra, Bali Strait between Java and Bali, and Lombok and Alas Straits farther east. South of Java, and west of Sumatra and the outer chain of islands which fringes part of its coast, the floor of the Indian Ocean sinks immediately to great depths.

2. Eastward of Java Sea and Borneo the waters within the archipelago have a greater general depth, and profound basins lie between the larger island-groups. Java Sea is connected north-eastward with Celebes Sea by Makassar Strait, between Borneo and Celebes, which has a greatest known depth of 1,389 fathoms. Celebes Sea, a circular basin enclosed by Celebes, Borneo, the Sulu Islands, Mindanao (of the Philippines) and the Talaut and Sangir Islands, has a depth of 2,795 fathoms about the centre. It is entered by Basilan and other straits from the Sulu Sea to the north (outside the Dutch area), and communicates south-eastward with Molucca Passage by various channels, of which Banka Passage is most important. By way of Molucca Passage southward, access is obtained to Banda Sea, which opens eastward of Flores Sea. This is the deepest basin in the archipelago, having a depth of 3,557 fathoms in the eastern part, under the chain of islets between Ceram and Timor Laut. Various smaller basins between the islands are distinguished by other names which need not be specified here. As off Sumatra and Java, so off the southern shores of the Lesser Sundas, great depths are quickly reached in the Indian Ocean.

3. The Arafura Sea, which lies south-eastward of Banda Sea, and, with Torres Strait, separates New Guinea from Australia, is over 100 fathoms deep only in its extreme western part, and its shallowness indicates that New Guinea rises from the same submarine platform as Australia.

From these indications, therefore, it appears that (1) the Great Sunda Islands, excepting Celebes, are physically attached to Asia, rising from its continental shelf ; that (3) New Guinea is similarly attached to Australia ; and that between them lies (2) a fractured zone in which steep ridges, the highest parts of which form islands, alternate with deep depressions.

All the islands, excepting a few of the smallest, are mountainous or hilly, and much of the region is strongly volcanic. A chain of volcanoes, both extinct and active, extends along the curved axis of the southern island-chain from Sumatra through Java and as far as Timor, and thence bends northward through the Moluccas. Some of the islands have not been free of disastrous eruptions in modern times : both Java and Sumatra have been so affected, and the most notable eruptions were those of Krakatoa, in Sunda Strait, in 1883. The geological structure of the islands appears to be in the main uniform in its broad outlines, though Borneo, from the relative paucity of volcanic rocks and absence of volcanic activity, is to be regarded as a stable area in comparison with Java and Sumatra. Ancient rocks occur more or less widely in Sumatra, Borneo, Celebes, and Timor : most of the others, so far as known, are composed largely of Tertiary strata, but over many of them volcanic ejecta lie to a great depth, and form the bulk of the highest altitudes in the archipelago. Widely spread by the action of rain and rivers, this volcanic material is of the highest importance in the formation of the most fertile soils of the archipelago.

The boundary between the Asiatic continental shelf and the deeper seas to the east, which is marked along Makassar Strait, the eastern edge of Java Sea, and Lombok Strait between the islands of Bali and Lombok (in which there are depths exceeding 600 fathoms), is known as Wallace's Line, after Alfred Russell Wallace, who pointed out its significance. The islands west of it, including Java, Sumatra, and Borneo, show forms of animal life and vegetation more or less closely related to those of Asia. The islands which rise from the deeper seas to

the east, on the contrary, show relations with Australia. On this view, therefore, the line is taken to represent the coast-line of the Asiatic continent down to a recent geological epoch, and it is held that Java, Sumatra, and Borneo formed part of the continent in Tertiary times, Java being separated first, and from Borneo sooner than from Sumatra. The line, in its biological significance, must not be traced too strictly; to some forms of life (spiders, for example) it does not apply at all, and some authorities have proposed an alternative zoological division between the Oriental and Australian zoological regions, passing through the deeper seas east of Timor, and leaving the Sula Islands to the west, and Buru, Ombi, and Halmaheira to the east. This has been called Weber's Line. In either case, Celebes is established as a transitional area between the two regions named above. Its faunal affinities are in great part Asiatic, but the fauna is more highly specialized than any other in the archipelago, and an earlier separation from Asia is indicated. The eastern islands, rising out of deep water—the result of a subsidence continued over a longer period than that which isolated the western islands—have at various epochs been united to the Australian continent (see further Chap. V, *Animals*).

FRONTIERS AND ADJACENT TERRITORIES

The Dutch possessions have land frontiers with the possessions of other Powers in only three places—(1) in northern Borneo, where Dutch territory is separated from the British protected territories of North Borneo, Brunei, and Sarawak; (2) in Timor, parts of which belong to Portugal; (3) in New Guinea. The diplomatic history relating to these divisions will be outlined in the later sections of Chapter XV. The frontiers in Borneo and New Guinea pass through territory which is little known, but does not appear to offer any serious occasion for future dispute. The position in Timor is different: the division of that island between the Netherlands and Portugal must be regarded as a rather unhappy legacy from the early colonial period (see Chaps. XIV, XV). The Portuguese possessions include the eastern half of the island, an enclave in the north-west, and the small island of Kambing.

Netherlands India is bordered across intervening seas by

British possessions in Australia and the Malay Peninsula, by an American possession in the Philippine Islands, by Siam, and (less directly) by French Indo-China.

LINES OF INTERNATIONAL COMMUNICATION

From the point of view of international communications, some of the sea-ways through the archipelago are of capital importance. It is unnecessary here to discuss in detail the sailing tracks through the various seas and straits, which, at any rate for sailing and low-powered steam-vessels, vary materially between the seasons of the two monsoons (for which see Chap. III). But the main sea-ways through the Dutch portion of the archipelago may be summarized as follows :

1. *Malacca Strait*.—Upon this passage converge all the routes from Indian ports, Colombo, &c., to Singapore and the East. The strait passes between Dutch territory on the one hand and British (and in the extreme north, Siamese) territory in the Malay Peninsula on the other. The strait is about 570 miles (statute) in length. At its southern end, Dutch territory in the Riouw Islands faces British territory across Singapore Strait at a distance of little more than 10 miles, and the straits leading to Singapore from the southward—Riouw or Rhio and Durian—pass wholly between Dutch islands. It may therefore be said that the Netherlands possess an important measure of territorial control over the much-frequented commercial routes upon which Singapore is a port of call. Moreover, Singapore is of prime importance as an entrepôt for the trade of Netherlands India (see further Chap. XII).

2. *Sunda Strait*.—Through this strait passes a large portion of the trade with China, Batavia, Singapore, and other ports in the Malay and China Seas ; routes from Colombo, from all parts of East Africa from the Red Sea to the Cape of Good Hope, and from western and southern Australia, naturally converge upon it. Separating Java from Sumatra, it is wholly under Dutch control. Its narrowest part, 14 miles across, is divided by Thwartway or Dwars in den Weg Island into two channels, each about 4 miles wide.

3. The straits east of Sunda (Bali, and those between the Lesser Sunda Islands) are of much less importance to communications generally than Sunda itself. Bali, Lombok, and Alas

Straits, however, are used by vessels dependent upon wind conditions in the season December–February, bound between Aden, Cape Town, &c., and China direct, when they pass eastward of Borneo through Makassar Strait. Either Lombok or Alas Strait, also, is commonly used during the north-west monsoon by vessels between Batavia, &c., and northern Australia and Torres Strait, when they pass by one of these two straits to the south of the Lesser Sunda chain and Timor into the Arafura Sea. The steamship route, however, in the south-east monsoon (and sometimes also in the north-west) lies north of the Lesser Sunda Islands, through Wetar Passage, and south of the South-western Islands.

4. The most important routes lying through the eastern part of Netherlands India are those between Hong-Kong, &c., and Darwin (Northern Australia) and Torres Strait (Thursday Island), for eastern Australian ports, &c. The route southward from Hong-Kong, Manila, &c., enters Celebes Sea through the important channel of Basilan Strait, which, however, is outside the Dutch area, being bounded on both sides by American islands, belonging to the Philippines. Crossing Celebes Sea, the route makes use of Banka Passage, close off the north-eastern promontory of Celebes, whence it enters Molucca Passage, leads between the Sula and Ombi groups, follows Manipa Strait between Buru and Ceram, and passes the Dutch port of Amboina. From here the course to Darwin lies across the middle of Banda Sea, and reaches Arafura Sea through the South-western Archipelago. The usual route to Torres Strait passes between the Kei and Aru Islands to the north-east, and Timor Laut to the south-west. Both these routes, between Banka Passage and Australia, thus lie through seas commanded by Dutch territory. Apart from its importance in connexion with traffic to and from eastern Australia, New Zealand, &c., the Torres Strait route is sometimes used by vessels between southern China and the Philippines, and Valparaiso and other South American ports. The importance of the route between Hong-Kong and Chinese ports and Darwin may be enhanced if, or when, Darwin becomes the northern terminus of an Australian trans-continental railway (to Adelaide, &c.): it has long been urged, for example, that the shortest mail and passenger route between Great Britain and Australia (assuming normal and favourable conditions throughout) would lie, in that case,

by the Trans-Siberian Railway, one of the Asiatic ports with which it is connected, and Darwin. Any of the routes converging upon Darwin from any direction between north and west lie through or very near some part of the archipelago of Netherlands India.

It may be remarked that Makassar Strait, between Borneo and Celebes, does not possess equal importance with other passages discussed above, apart from the position of the port of Makassar as an entrepôt: the relative importance of the principal ports, however, will be discussed in Chap. XII.

DUTCH PROGRESS IN NETHERLANDS INDIA

Relative Importance of Java

In respect of economic development, and of the extension of their rule over the archipelago, the record of the Dutch is one of slow methodical progress from Java as a centre. It has been stated above that Java is not the largest, but is the most populous and economically the most important island. The contrast between it and the Outer Possessions is remarkable. The Outer Possessions altogether are over thirteen times larger than Java in area, but the population of Java is at least three times larger than the estimated population of the Outer Possessions. It might be expected that some outstanding factor in the natural conditions or the history of the archipelago would be found to account for this phenomenon, but this is not so, and the reasons for it are not easy to discover. It is said that the population of Java has increased about eight-fold¹ during the century since the restoration of the Dutch rule (see Chap. XV); so that the establishment of settled government and peaceful conditions, and the large extension of agriculture in a country of extreme natural fertility, may be taken to account at once for the large increase of population and for the pre-eminent position of Java. But this position was established long before Europeans entered the archipelago. An additional, and perhaps the leading, reason for it was the

¹ For comparison it may be observed that the area of Java is not quite as large as that of England; but the average density of population is about 709 persons per square-mile, against 668 in England by the census of 1911. The population of England and Wales increased not quite four-fold in the nineteenth century.

relative ease of access to Java from the sea, and of penetration inland. Behind the coastline facing the interior seas, Java has not so wide a tract of heavily forested, marshy lowland as either Sumatra or Borneo ; nor, on the other hand, does it oppose to penetration almost continuously broken country from the coast inward, as Celebes does. The mere bigness of Sumatra and Borneo, as contrasted with Java, makes them less easy of control by an invader, and offers more refuge for primitive peoples. It does not appear to be just to regard Java (as it sometimes is regarded) as owing its importance simply to a degree of fertility largely in excess of the other islands. Its natural fertility is no greater, for example, than that of the most fertile parts of Sumatra.

Summary of Economic Development

In view of the relative importance of Java it is necessary to deal with that island in greater detail than the rest. At the same time it must be borne in mind that Java does not epitomize the whole of the problems which confront the Dutch in the administration and economic development of their Indonesian empire : some writers on Netherlands India have certainly concentrated attention too nearly exclusively on Java. In the chapters on the inhabitants of Netherlands India (V, VI, and VII) it will be shown that the Dutch have to deal with native peoples in almost every stage of development, from the highly-organized agricultural society in Java and the active trading communities in the coast-lands of nearly all the islands, to the uncivilized and largely uncontrolled inhabitants of the interior, who have practically disappeared in Java, but are found in all the other larger and a majority of the smaller islands. The comparative political and economic importance of the islands, and their widely divergent potentialities, may be best understood from a consideration of the varying conditions of native society ; for that reason the individual native peoples of the archipelago will be described in some detail in Chapters VI and VII. In Chapter XI the economic position of the several parts of the Outer Possessions will be indicated by considering firstly native production, and secondly European commercial enterprise. From the latter point of view the condition of the islands may be summarized as follows.

(1) Java (see Chap. X) is in full industrial development : its

industry rests primarily on the basis of agricultural and forest resources, for the island has no great mineral wealth. While it affords opportunity for the use of European capital on a large scale, it cannot attract in large numbers the individual European colonist of limited means, for it does not offer him the prospect of rapidly acquiring wealth.

(2) Sumatra and some of its neighbouring islands are in process of development in respect of both agricultural and mineral resources; this process, while far from the stage reached in Java, is much further advanced than in the other islands.

(3) In Borneo, so far as development has proceeded, the main interests are rather in mineral than in agricultural production, but on the whole the island stands at a lower stage than Sumatra, and probably than Celebes.

(4) The development of Celebes progresses chiefly in the direction of agricultural and forest resources.

(5) Of the Moluccas, the northern groups have small prospects of development at present; in the southern groups, which are more fertile and populous, agricultural and forest production is further advanced.

(6) New Guinea is undeveloped, and (7) the Lesser Sunda Islands, as a whole, show no great economic possibilities.

Administrative and Economic Problems

In Chapter VIII the methods of Dutch administration will be discussed, and a distinction will appear between territories which are ruled directly by the Dutch and those in which government is carried on by natives under Dutch guidance, with a further distinction between those territories in which native rulers administer either Dutch law or their own. Finally, there are the territories, gradually decreasing in area, over which Dutch sovereignty is merely nominal.

In the course of administration and economic development the Dutch have to deal (1), as already seen, with native peoples at all stages of civilization; (2) with a varied immigrant population of Arabs, Chinese, Japanese, and Indians, to whom are occasionally added a few negroes from Africa and America, Koreans, Pacific Islanders, &c.; (3) with a large half-caste element; (4) with European settlers other than Dutch. The positions and characteristics of these various elements will be

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dealt with in Chapter V and elsewhere, and it will be endeavoured to indicate the social, political, and economic problems associated with them. For summary purposes, it is probably true to state that of these problems the most serious (if not necessarily always the most prominent) are those concerned with education, labour, and the relation between Mohammedanism and the State.

(1) In regard to education of natives of the higher orders of intelligence, it is held that this should be directed towards improving their aptitude for agricultural and industrial pursuits, rather than towards qualifying them for clerical or administrative positions, or instructing them in European social and political ideas. This view meets with opposition from some of the natives themselves: the Javanese aristocracy, for example, inclines rather towards the latter than towards the former objects of education indicated above.

(2) The labour problem (see Chap. IX) is manifold: in agriculture it is connected mainly with the education of the native in an occupation with which he is already acquainted, and in which he prefers his own primitive methods, and adopts improvement unready. In the mining industries this particular disability is absent, but the usual problems connected with the importation of coolie labour arise. In Java there is plenty of native labour on the spot; in the Outer Possessions this is not the case as a rule.

(3) Each immigrant Oriental race brings its own problems—the Japanese, with their peculiar legal position as equal to Europeans, in distinction from all other Orientals in the archipelago, and their rapidly growing commercial and other interests there; the Chinese with their social influence upon the natives and their position of rivalry with Europeans in various departments of trade; and lastly, the Arabs, with the commanding influence of their religion. The position and wide extension of Mohammedanism will be discussed in Chapter V. The power which might be used under its influence against the established régime of the Dutch (which does not in theory include the moral support of any one religion against others) would probably be exercised not by immigrant Arabs so much as by the native Mohammedans. The development and possible outbreak of Pan-Islamic tendencies have given ground for apprehension, and it is asserted, on strong evidence, that of recent years Germans

have been endeavouring to extend their influence over the Mohammedans in the archipelago and to foment the extremists among them, a process kindred with attempts to create disaffection in the army of Netherlands India, and to use that territory as a starting-point for intrigues in British India.

Comments on Dutch Administration

‘Wise, paternal, methodical,’ are epithets applied to the Dutch administration by its admirers ; it has been said that the Dutch in Netherlands India have afforded ‘a rare example of a political intelligence which is equally tenacious and sagacious’, and that ‘their system of administration is full of valuable lessons for the other colonial Powers of Europe’. Their critics have charged them with administering their colony for the benefit of the State at the expense of the individual, with an attitude of needless austerity towards the native population, and with failure as colonists, successful though they may be in extorting quick returns for the investment of their capital. The Dutch colonial official, who appears as a rule to reach a high standard of efficiency, has been commonly blamed, on the one hand, by the more advanced natives for encroaching upon their rights and refusing to encourage their natural inclinations in education and towards nationalism ; on the other hand, by the unofficial European colonist or resident, who claims that his dealings with the native are too closely and suspiciously supervised, and that he himself is practically denied any element of citizenship in the colony. Such criticisms suggest, in effect, an honest endeavour on the part of the administration to hold a true balance between irreconcilable interests, seeking favour from neither side. The development of the colony, judged merely by its enormous area, has been slow and proceeds slowly, but the resources of the mother country are limited, and there is no evidence of either neglect or shortness of sight. The administration of the Dutch is accompanied by serious study of the lands and peoples within their dominion, which, as exemplified in the publications quoted in the bibliography attached to this volume, is worthy of all possible praise.

CHAPTER II

PHYSICAL GEOGRAPHY AND GEOLOGY

Java—Islands adjacent to Java—Sumatra—Islands adjacent to Sumatra—
Borneo—Islands adjacent to Borneo—Celebes—Islands adjacent to Celebes
—The Moluccas—Dutch New Guinea—Islands adjacent to New Guinea—
Lesser Sunda Islands.

JAVA

Physical Divisions and Relief

JAVA, situated between Sumatra to the west and the chain of the Lesser Sunda Islands to the east, extends from $114^{\circ} 31' E.$ and $8^{\circ} 47' S.$ in the promontory of Balambangan, to $105^{\circ} 12' E.$ in Java Head, and $5^{\circ} 47' S.$ in St. Nicholas Point (at opposite ends of Sunda Strait). The island may be described in the simplest terms as consisting of a central mountain chain extending longitudinally from east to west, and flanked by lowlands, almost continuously on the north, but intermittently on the south.

But the customary physical division of Java is into (a) East, (b) Middle, and (c) West, the middle part representing the isthmus which connects the wider and more massive eastern and western parts: each of these divisions has certain structural characteristics of its own.

(a) *East Java* consists (1) of a peninsula extending from Bali Strait westward to a line drawn approximately south from Pasuruan, (2) of a wider portion, the main mass of East Java, westward of that line as far as the longitude of Surakarta. In this division lowlands and highlands are less sharply divided than in the others, and the volcanic eminences, instead of rising in groups or masses like those farther west, stand isolated.

The eastern peninsula throws off a large limestone promontory or sub-peninsula south-eastward, called Balambangan, which, though of considerable elevation itself, is attached to the mainland by a very low and partly marshy tract. For the rest the peninsula is dominated by three isolated volcanic masses, which may be distinguished (from east to west) as the

Ijen, Iyang, and Tengger highlands, in which the highest summits are respectively Merapi, 9,186 ft., and Raung, 10,932 ft., Argapura, 10,102 ft., and Mahameru, 12,718 ft. Many short streams drain radially from these isolated highlands. The watershed which divides those flowing to the north and south coasts respectively lies north of the axis of the peninsula, and the widest extent of lowland is on the south coast, where the Bandayuda is the principal river, and the low island of Nusa Barung lies off its mouth. This lowland is bounded both east and west by spurs from the central mountains, which reach the coast. There are well-marked passes northward from this lowland between the volcanic masses to the coastal plains of the north, which are narrow, the northern lowland being in great part drowned beneath the Strait of Madura, and are also interrupted by the bold eminence of Ringgit (4,100 ft.) and by spurs of the central volcanic mass.

In the main portion of East Java (westward, that is, of the peninsula just described) the volcanic highlands again stand isolated: thus, westward of the Tengger we have another group in which Arjuna reaches 10,968 ft. and Butak 9,420 ft.; next, the Willis group, of less elevation; then Lawu, 10,777 ft., and lastly, south of Semarang on the border of Central Java, the group in which Merbabu rises to 10,318 ft.

It is a distinguishing feature of this part of East Java that the main watershed lies far towards the south of the island, turning sharply in that direction from the summits of the Tengger highland. At one point, above the head of Gemah Bay, it approaches within two miles of the south coast. There is thus practically no south coastal lowland, while the lowlands which drain northward separate the volcanic masses described above, and, beyond them, are broken by a succession of lower elevations—mainly limestone—which rise in detached masses or short ranges with a general east-and-west direction, as far as the north coast itself.

The major proportion of the lowlands in this division belong to the strangely-shaped basins of the Brantas and the Solo, two of the principal rivers of Java (p. 26), which in their upper parts provide north-and-south lines of communication between the volcanic highlands, and in their lower parts east-and-west lines between the lower ranges mentioned above. Leaving the volcanic area northward, the Brantas is diverted by the central

limestone range eastward to the coast in Surabaya ; the Solo breaks through this range, but is diverted by another which flanks the north coast and is continued in the island of Madura.

The plains of the north coasts in Japara, Pasuruan, and Besuki are to be distinguished from the plains between the limestone hills and volcanoes. The Japara plain is composed of mud from Serang and Juwana and volcanic matter from the isolated peak of Muria. The Juwana plain is formed of marine sand and clay, and the plains of Rembang and Surabaya are of similar composition. On the south coast the low-lying land consists largely of marsh and sand-hills.

The plains of the interior are different. The Solo plain, extending north and south between the volcanic peaks of Merapi and Lawu, contains volcanic matter brought down by the Solo river. There are plains similarly situated farther east in Madiun and Kediri. The Malang plain in Pasuruan, sloping gently from north to south (from over 1,000 ft. to 1,600 ft.) is of volcanic material, in which the Brantas has worn a bed over 300 ft. deep. The Lamongan plain in Probolinggo, consisting of volcanic sand, lies at an altitude of about 180 ft., and descends slightly towards the south, where it becomes alluvial.

(b) *Middle Java*.—In this relatively narrow division the mountains assume a chain formation with fewer volcanoes, and these more widely separated. This system is marked off from the mass of Merbabu and Merapi (above) by the Kedu valley, through which the River Praga flows. West of this, the mountains extend along a line from south-east to north-west as far as the Dieng plateau, after which the line runs from east-north-east to west-south-west, and includes the summit of Slamet, over 11,000 ft., and other heights ranging from 4,000 to more than 8,000 ft. The direction of the line then changes to west-north-west, and so continues as far as Cherimaj (10,098 ft.) south-westward of Cheribon. The main watershed lies approximately midway between the north and south coasts, and there are plains along both.

The Kedu valley is shut in on the south by a limestone ridge which is independent of the main volcanic range, and runs transversely south of the valley of the Serayu. The only important outlet from the plain to the south is through the opening made by the Praga. Between the main range and the limestone hills is the considerable plain of Banyumas, and

south of them are the extensive lowlands of the south coast. In the north the coastal plain is interrupted by the hilly region to the north of the Dieng plateau.

(c) *West Java*.—In West Java the mountains are massed in the south ; the main watershed lies well on that side of the island ; except in the extreme west there is little low-lying land along the south coast, while on the other hand the northern lowlands attain their widest extent. The bulk of the mountain system is comprised in the Preanger Mountains. The Halimon Mountains at the junction of Preanger, Batavia, and Bantam constitute a westerly extension of the main group, while across the Manuk valley to the north-east are the mountains of north-eastern Preanger and Cheribon. In an isolated position well to the north-west are the highlands of Bantam, and in the extreme south-west corner of the island are the thickly-wooded hills of South Bantam. While elevations exceeding 6,500 ft. occur in all these groups, the highest point (Chikuraj, 8,596 ft., in eastern Preanger) by no means approaches the principal summits of the middle and east divisions.

The northern plain of the division of West Java extends from Cheribon to Bantam. The strip along the coast, formed by the action of the sea or rivers, is to be distinguished from the low ground inland. The first is a later formation and is not more than 50 ft. high, while the earlier formation behind sometimes rises to a height of more than 300 ft. The two surfaces are sometimes separated by a sill or terrace, two or three feet high. The coastal strip varies in width from three miles to twenty-five, being greatest at the river deltas. Both in this and in the middle division the larger streams have built out a succession of alluvial promontories at their mouths, as in the case of the Badri, Tyomal (Chomal), and Pemali in Middle Java, and the Manuk, Tyupunagara, Tarum, and Pontang-Ujung in West Java. In Krawang and Cheribon there are marshes along the river courses and at the sea coast.

Volcanoes.—In Java there are about 125 volcanic centres, of which 13, Gedeh, Tangkuban Prah, Gutar, Papandayan, Galunggung, Slamet, Sendor, Merapi, Kelut, Bromo, Semeru, Lamongan, and Raung, are active. The activity of most of these is trifling, although where the cones remain unbroken, serious eruption is always a possibility. The volcanic mountains are of typical form, rising from a broad rounded base with

regular sweeping lines to the conical top. Some, however, end abruptly half way up the upper cone in a broken line where the whole surface of the broad summit is a confusion of cliffs, mounds, and fragments, with steam roaring from numerous vents. There are examples of this in the twin mountains of Gedeh and Pangerango, which are separated by a saddle. The whole top of Gedeh has been blown away or fallen in, and is constantly steaming, while alpine plants grow upon the quiescent summit of Pangerango. Another example is the summit of Papandayan, where mounds and columns of pure sulphur cover the whole area. There are also pools of boiling water domed over by a thin crust of sulphurous calcareous rock dangerous to cross. Runnels of very hot water and of cold surface-water flow near each other over the rough bare broken surface of the crater field. The mountain has a truncated profile similar to that of Gedeh. The famous Bromo 'sand-sea' is the broken-down floor of an enormous crater which once towered above its neighbours.

Rivers

Java is abundantly watered. As a consequence of the trend of the central mountain range from east to west, the rivers flow generally north or south. As the longer slope of the island is for the most part from south to north, it is in this direction that the longest rivers flow. To this rule there are local modifications, particularly in the broad part of East Java, where the Solo and the Brantas, as has been seen, are diverted to the east by limestone ridges. The drainage areas of the rivers entering the sea on the north coast constitute 63 per cent., and that of the south-coast rivers 32 per cent. of the whole area of the island. In Middle Java, where the central range approaches the north coast, there is a group of rivers of considerable length flowing southward to the Indian Ocean.

The volume of the rivers varies considerably, according to the season. During the north-west monsoon, roughly from October to May, the rainfall is heavy, and, in the west, violent. At this time, therefore, the rate of discharge is high, and floods often ensue, and may cause damage to bridges and property. In the period of the south-east monsoon, from May to September, when rainfall—especially in East Java—is scanty, the rivers

are naturally low. The great majority of the rivers are short and rapid.

In East Java the largest and most useful river is the Solo, which rises in the mountains near the south coast, meanders over 310 miles of country, with intricate windings in its middle and lower course, and reaches the sea by two mouths opposite Madura. The next largest river is the Brantas, which rises in the plateau of Malang, runs south, turns west under the southern limestone range, flows north between the mountains, and then runs east to the gulf of Madura with two widely-separated distributaries—the Porong and Mas. The river thus describes a nearly closed square and is clearly consequent upon the present physical features.

In Middle Java there are several large streams in the southern coastal plain. In West Java two rivers only, the Tarum and Manuk, are of importance. They rise in the great volcanic group and flow nearly across the island. They are useful for irrigation but for little else. As already shown, these rivers, like others in Middle and West Java, are building the land out into the sea. The loose volcanic soil is brought down from the mountains in suspension and dropped in the sea water. The land at these delta capes is advancing seaward at a rate estimated, in the case of the Tarum and the Manuk, at 21 ft. annually.

The rivers of Java are navigable only by native craft of small dimensions, and this to a limited extent. In this connexion they are dealt with under the heading of *River Transport* in Chap. XII.

The rivers of Java are used extensively for irrigating rice and other crops. The rivers best adapted for this purpose are those flowing northward to the Java Sea. In the southern plains the only important irrigated areas are the valley of the Upper Serayu and the coast district bounded on the east by the Bogowonto and on the west by the Lukula. Among north-flowing rivers, the waters of the Brantas are used at its source, in northern Kediri, and in the delta formed by its mouths. The Madiun, a tributary of the Solo, serves to supply the plain of Madiun. From Japara along the coastal plain to Indramaya there is an almost unbroken stretch of irrigated land watered by the numerous rivers of Semarang, Pekalongan, Tegal, and Cheribon. Farther west, the Liwung nearly through-

out its length, and the Ujung in Bantam for many miles up from its mouth, are used for irrigation. In the interior valleys the water from the little mountain-streams is led here and there by small channels that sometimes run side by side upon the crown of a spur in opposite directions towards rice-fields on either side of the broad ridge. The wide terraced rice-fields ranging all along the lower lands below the mountain shoulders rise tier upon tier towards the higher plantations of tea, coffee, or cinchona below the dense forest. These terraced rice-fields are sometimes shimmering with water which is led by bamboo pipes through the corners of the curving terrace banks, so that from the abundant small mountain streamlets the whole lower land can be flooded, or the supply can be diverted during the ripening of the rice. (See further Chap. X.)

Coast

North Coast.—The action of the rivers flowing into the shallow Java Sea have contributed to the formation of a narrow flat tract of shore, which extends with only occasional and insignificant intermission along the whole northern coast of Java. In appearance it varies in different localities. The north-east coast is generally even and wooded, with banks of mud and sand (except at salient points) which render approach difficult, and dry at low water. From Ujong Panka to Tanjong Aur Aur there is a sand beach. The coast is low and flat beyond this as far as Mandalike, after which its character markedly changes, and as far as Teluk Aur it is rocky and irregular, with sharp projecting points and intervening creeks. A section of this coast eastward of Japara is densely forested, uninhabited, and sharply sloping up to mountains immediately behind it. Beyond Teluk Aur westward the low coast is resumed : in the vicinity of Tanjongs Indramayu, Sentigi, and Bobos it affords good landing. The whole stretch west of Cheribon, however, is low, often marshy, and covered with mangrove woods and nipa. The shore of the bay fronting Batavia is, for the most part, a muddy marsh, intersected by shallow streams, some of which have been canalized for boats. Thence to Sunda Strait the coast is low, and, excepting a few firm patches with villages in coconut groves, it is swampy and overgrown. Generally along its whole length the coastal strip shelves gradually

out to sea, but at the mouths of rivers the silt has formed banks of sand and mud. Under the influence of rivers and currents the coastline is subject in places to rapid alteration, of which an example, showing changes in 37 years, is given in the annexed sketch-map. The coast presents many bays, but none penetrates deeply. The best harbour is Surabaya, which consists mainly of the strait between the mainland and Madura. By artificial means another important harbour has been constructed at Tanjong Priok in the Bay of Batavia.

South Coast.—The south coast differs from the north. The ocean floor sinks to great depths close off shore. Prevailing currents sweep away the alluvial deposits, but in certain regions throw them back in the shape of sand ridges. From the mouth of the Serayu to the Upak (along the coast of Banyumas, Bagelen, and Jogyakarta) there are three ridges of sand about 50 ft. high, and varying in width from 100 yds. to 600 yds. These dunes are liable to shift, and during the south-east monsoon they tend to block the mouths of the rivers, diverting their courses to the west. Less extensive sand ridges are found in south-east Probolinggo, in south-west Besuki, in the plains of Lumajang and Pugar, in parts of Preanger south coast, in the peninsula in the extreme west, and in the Blambangan peninsula in the extreme east of the island. The sand dunes often enclose lagoons and marshes.

East of the Upak are steep cliffs about 150 ft. high, which follow the line of the limestone hills of South Java and for some distance present no inlet. Beyond Sempu Island, in South Pasuruan, and again in South Besuki, the spurs extend to the shore, where they project as headlands, and sometimes form inlets flanked by cliffs. Huge rocks broken off from the cliffs rise out of the sea to a height of over 1,600 ft., and the coast in these parts is generally irregular.

This coast is little frequented by ocean-going ships, having only two safe harbours—Chilachap and Segoro Wedi Bay. The approach to Chilachap is difficult, but Segoro Wedi is one of the finest bays in Java, and the anchorages on the eastern side are good and safe, except when a heavy swell enters. This swell breaks unceasingly on all exposed parts of the south coast of Java.

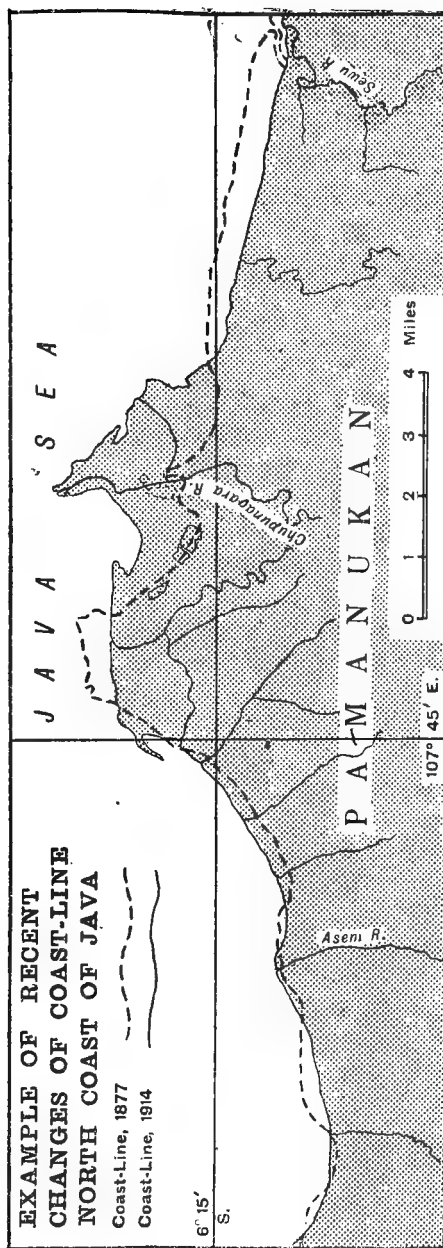


FIG. 1. Example of recent changes of coastline, north coast of Java

Geology

The percentages of surface rocks in Java are given thus : pre-Miocene (Cretaceous and Eocene), 1 ; Miocene and Pliocene, 38 ; volcanic, 28 ; post-Tertiary and recent, 33. A transverse section of the island shows that it may be divided geologically into longitudinal strips corresponding approximately to the northern lowlands, the central volcanic highlands, and the broken highlands and lowlands of the south. The northern strip, a stable denuded plateau with a massive downthrow, is divided by faulting from the central strip, upon which the volcanic cones are piled, and this again is divided by a second fault line from the southern strip, which sank lower in late Tertiary times. Allowing for the irregularity of denudation, the geological map shows the symmetry of this longitudinal arrangement throughout the island. This longitudinal strip arrangement is modified by cross-fractures, and the volcanic development is interrupted in the western part of the middle-third of the island (Tegal and Banyumas) where the broad central band of Miocene is flanked by quaternary on either side. The presence of the dividing faults furnishes an explanation of the concurrence of earthquakes with the greater volcanic eruptions.

The volcanoes of the central strip have piled mountainous masses of ejectamenta upon the land. In the eastern division of the island the volcanoes are arranged upon two long east-and-west lines. These are interrupted by the extension of sedimentary rocks right across the island southward from Semarang. Westward from Cheribon, however, the massed volcanoes are arranged upon a number of cross-fracture lines, so that a large part of the western division of the island is covered by volcanic products resting upon the Tertiaries. There is also in this division a great display of intrusive rock, andesite and basalt, detached from the volcanoes and scattered over the Tertiary deposits through which they have intruded.

The platform upon which the volcanic mountains rest is a denuded plateau of highly-folded rocks, for the most part Tertiary, with indications of Cretaceous sandstones and of Palaeozoic schists underlying these. The structure of the northern lowlands varies little throughout, but the projecting massif of Muria, north-eastward of Semarang, is mainly formed

by a detached volcanic mass, older than the central volcanic chain, and of different character, containing leucite and phonolite rocks which occur elsewhere only in the Ringgit volcano on the north coast and at Besuki. The island of Madura and the smaller islands surrounding it are mainly of limestone, and entirely non-volcanic. For the rest, northward of the central mountains there is a steeply tilted boss of limestones, with eruptive particles of hornblende, augite, andesite, &c., and some admixture of conglomerates, marls, and shales. Against this boss, to the north, rests a crumpled series of anticlines and synclines, all denuded, and upon the eroded edges of these are horizontal Quaternary formations, overlaid towards the north coast by recent alluvial deposits.

South of the central mountains a strong anticlinal fold is displayed, with highly inclined middle Tertiary strata dipping towards the south, and the upper limestones resting unconformably and nearly horizontally upon the lower sandstones, marls, shales, slates, conglomerates, and breccia.

The 'old slate' rocks of Sumatra, Borneo, &c., do not appear in Java. Granite is occasionally found in the western volcanic breccias. The oldest rocks are some serpentine schists and mica schists. The sedimentary series upwards to the Jurassic are not represented; the Cretaceous only in one small inlier strongly upfolded near the centre of the island east of Banyumas. The great thickness of the Miocene is, in comparison with the other formations, the characteristic stratigraphical feature of the island. Superficially, therefore, Java—as compared with other parts of the region such as Borneo and Sumatra—is of remarkable simplicity. It is not a country where abundant mineral wealth is to be expected.

ISLANDS ADJACENT TO JAVA

Of islands adjacent to Java (other than those in the main chain to the west and east, which will be dealt with under the headings of Sumatra and the Lesser Sunda Islands) the most important is Madura. This island lies off the north-east coast of Java, of which it is physically a part, being separated from it by a shallow strait less than $1\frac{1}{2}$ mile across at its narrowest part, while the north coast continues the line of the north coast of Java. Madura is a little over 100 miles long, and 24 miles in

greatest width. The surface is undulating, but nowhere mountainous. In the western half no greater elevation than about 700 ft. is attained, and the hills are broken by the valleys of the Balega, Sampang, and other streams. In the east the central spine of hills is more continuous, and an extreme height of 1,565 ft. is found. The north coast is bold, and the lowland fringing it is of no great width; the south coast is fringed by shoals, islets, and mud-banks. The geological formation reveals the relation of the island to the adjacent part of Java, consisting of similar rocks (limestones, &c.) of Tertiary age. There are low alluvial tracts at intervals, principally along the south and north-west coasts.

A chain of small islands extends eastward from Madura, terminating in the Kangean group, of which Kangean Island is about 25 miles long east and west, and from 3 to 13 miles wide. Its extreme height is something over 1,500 ft.

The other principal groups of islands in the Java Sea, which may be mentioned in this section, are the Karimon, Java, Boompies, and Thousand Islands.

Karimon or Krimon Java, north of Madura, is a group of some 25 islands, of which the largest is Karimon, which rises to 1,660 ft., and is level only at its south-west point, where there is a village. With Komodian Island, lower and smaller, but also rocky, it is enclosed in a coral reef.

Boompies is a wooded coral island nearly north of Tanjong Indramayu, with adjacent reefs.

The Thousand Islands (actually about 80) and other groups extend northward from the western horn of Batavia Bay; they are low, tree-covered islets surrounded by steep coral reefs: only a few are inhabited.

Off the south coast of Java there is no island of importance. In Sunda Strait the volcanic island of Krakatoa (see p. 12) is conspicuous among others.

SUMATRA

Sumatra lies between $5^{\circ} 39' N.$ and $5^{\circ} 57' S.$ lat., so that the Equator divides it into two nearly equal parts. Its axis runs from south-east to north-west. It is 1,060 miles in length, and is over four times as long as it is wide at the widest part (248 miles), which falls at the point where the island is inter-

sected by the Equator. On the western side, where a chain of islands lies along the coast, it borders on the Indian Ocean ; it is separated from Java, to the south-east, by Sunda Strait, and from the Malay Peninsula, to the north-east, with which it runs roughly parallel, by Malacca Strait.

Surface

Sumatra consists of a high mountain chain, running along the whole of the western coast, with a broad belt of flat alluvial country occupying the whole length of the island to the east, and forming a homogeneous whole, with no important elevations. To this extent Sumatra resembles Java in structure. The mountain chain is a link between that of Java and the West Burmese chain, with which it is connected through the Andaman and Nicobar Islands, and runs for a distance of more than 1,000 miles, rising to numerous volcanic peaks from 5,000 to over 12,000 ft. high. The mountains lie close to the west coast of Sumatra through the whole distance, with small plains in some parts rising to the foot-hills from the sea, while elsewhere the hills come right down to the coast. The whole system, which is referred to as the Barisan Mountains or Bukit Barisan, consists in general of two or more folded chains, running parallel to each other, with a valley between. This valley is broken up into separate sections by the intrusion of volcanic massifs, and in it lies a row of mountain lakes, chief among them (starting from the south) being Ranau, Korinchi, Singkarak, Maninjau, and Toba. The last is by far the largest, being 45 miles long by 15 in extreme width. There are characteristic differences between the mountains of the south of the island and of the north : in the south the range consists chiefly of parallel chains lying near together, enclosing only a few small plateaux ; to the north of 1° N. the mountains broaden out to a wide plateau, falling away steeply to the west, and partly surrounded by mountain peaks. This plateau includes the larger part of north Sumatra, the coastal plain to the east being narrower than in the south, and descends in terraces to the small plains with which it is edged on the western and northern coasts. The whole range is topped with a line of volcanoes, mostly close to the west coast ; several are still active, ash and scoriæ being spread over a wide area, though lava streams are seldom emitted. Chief among these volcanic peaks are Kraka-

toa (2,703 ft.) in Sunda Strait, Dempo (10,236 ft.) in the Pasuma group, Kaba (6,528 ft.) in the Rejang group, Peak of Indrapura (12,484 ft.) in the Korinchi group, Talang or Sulasi (8,339 ft.), Singalang-Tandikat (9,479 ft.), Merapi (9,484 ft.), and Pasaman-Teleman (9,844 ft.), all in the Padang highlands, Sorik Berapi (5,875 ft.) in the Mandailing group, Pusuh Bukit (6,562 ft.), Dolok Sibayak (7,075 ft.), and Dolok Si Nabun (7,930 ft.), in the Batak country. Mount Kaba (5,400 ft.) recently covered the area surrounding it with volcanic sand, and caused the temporary destruction of plant and animal life. Merapi has a crater lake of boiling mud.

Rivers

Owing to the position of the mountains in Sumatra, the rivers on the west coast are all short, running in valleys with a steep slope, and having a very short lower course; they are unnavigable, except near the mouth in the case of a few, and the largest, the Singkel, is almost useless for shipping owing to the bar at its mouth, though farther up it forms an excellent means of communication in spite of the rapids in its course. In the south the rivers have made small deltas in the sea-diluvium of the coast, and north of Benkulen as far as 2° S. and between Padang and Priaman are marshes which hinder the discharge of the rivers, and are caused by the heavy surf off the coast or by bars of sea-sand preventing the mud in suspension in the rivers from being carried out to sea.

On the east coast of Sumatra the rivers running through the alluvial plains have wide drainage areas, and form the most important means of communication, and therefore the chief lines of settlement, the native states which have arisen on their banks being frequently called after the river. The largest rivers on the east coast, beginning at the south, are the Musi, the Jambi, the Indragiri (Kwantan), the Kampar, the Siak, the Rokan, the Panei, and the smaller Asahan, Serdang, and Deli rivers to the north of these. The most important are the Musi and the Jambi. The navigation of the principal rivers is dealt with under the heading of *River Transport* in Chap. XII.

The greatest difficulties in the way of navigation on all the rivers on the east coast are the wide mud-banks at their mouths, the changes in the height of the water, due to the irregularity of the supply and the tides running up the mouth,

and the frequent rapids in their upper courses. The coast is lined with morasses, the rivers in some cases spreading into enormous intercommunicating deltas. The different drainage systems are not joined by practicable roads near the coast, and there are in the case of most of the rivers no considerable settlements at the mouth. In the case of the smaller rivers to the north, conditions are different, since the growth of the tobacco plantations has led to the establishment of communications along the coast.

The constant rainfall, however unpleasant for colonists, gives abundance of water, and will provide power for mining machinery and for the removal of waste products when the minerals of the island are further exploited.

Coast

West Coast.—The west coast of Sumatra is in great part high and rocky, particularly between 2° S. and Padang, where the mountains come right down to the sea in places. Between Mokko Mokko and Cape Vlakke Huk the coast is on the whole bold and difficult of approach, but the mountains lie farther inland and the land near the shore is covered with alluvium and is frequently marshy. North of Padang the coastal marshes begin again; between Tikou and Tapanuli Bay the alluvial land is broken by stretches of granite, diabase, &c., on which various settlements have arisen, e. g. Natal and Ayerbangis. In this part of the coast the sea has eaten away the land in a series of semi-circular bays. Tapanuli Bay is surrounded by mountains, chiefly sandstone, and north of it, as far as Trumon, is a wide alluvial plain. From thence to Koningspunt the coast is only marshy in places, as at Melabuh.

The sea is from 20 to 50 fathoms deep in most parts of the west coast close offshore, falling to great depths beyond the narrow coastal shelf. A chain of islands (see p. 39), of which the most important are Simalur, Nias, the Batu Islands, the Mentawai Islands, and Engano, extends parallel to the coast at a distance of about 60 miles, between the parallels of 3° N. and 3° 30' S.; they are for the most part unsurveyed, as is the larger part of the west coast, and uncharted dangers are numerous.

The best harbours of Sumatra are in the central part of the west coast, where there are several inlets well protected from the sea by islands, which make good harbours, e. g. Emma-

haven, on Koninginne Bay. North of Tapanuli and south of Indrapura none of the indentations in the coast affords complete shelter from the south-west monsoon. Benkulen has a bad roadstead, though it is joined to the east coast by a good road-system ; Ayerbangis is of small use for shipping, since it is open and exposed, and Natal is encumbered with reefs. Tapanuli Bay is well sheltered by Morsala Island, and the trade of its port, Sibolga, shows promise of development, though its hinterland is unproductive. Singkel has a good roadstead, but the river is barred with shoals, on which the surf breaks continually. Only the outer route, outside the islands, is free from danger for shipping ; the central route, halfway between the coast and the islands, is wide, and safe night and day in favourable weather for vessels of light draught, but sailing ships are at the mercy of the currents in light and baffling winds ; there is no anchorage, and in some parts there are dangerous coral shoals. This route is frequently taken by Dutch war vessels, and by the coastal mail steamers. The inner route has many places which afford a moderate anchorage, but is seldom chosen by sailing ships going north ; there is always considerable risk in using this route at night. The development of the west coast for trade and settlement is much hindered by the difficulty of access from the sea, owing to the coral reefs and the breaking surf, and by the lack of communications inland.

East Coast.—The whole of the east coast of Sumatra from Diamond Point to Varkenshuk is formed of morasses and sandbanks, breaking up into innumerable points and islands at the mouths of the rivers, so that it is often difficult to distinguish land from sea. The coast is constantly advancing, and is made up of the sediment brought down by the rivers, the spread of mangrove vegetation, and the sand and silt deposited along the shore by the shallow sea. It is largely uninhabited, such population as exists getting a livelihood by fishing. The value of such a coast for trade and settlement is dependent on the character of its rivers (see p. 34). Belawan, at the mouth of the Deli River, is the principal harbour for the tobacco-producing district of Deli, since there is railway communication with the interior, and vessels of 12 ft. draught can enter the river with a pilot.

North and South Coasts.—The north coast of Sumatra, between Raja and Diamond Point, is very varied ; in some

places cliffs rise precipitously from the sea, and are crowned with dense vegetation ; in other parts there are sandy beaches or cultivated and well-populated plains. The two chief harbours are Oleh-leh and Sabang (on Weh Island) : Oleh-leh is the chief distributing port for the north of Sumatra, but there is liable to be a heavy sea in its roadstead during either monsoon ; Sabang, whose importance lies in its position as a possible port of call at the entrance to Malacca Strait, has a bay which is completely sheltered in all weathers.

At the southern extremity of Sumatra there are two deep indentations, Lampong Bay and Keizers or Semangko Bay. The eastern shore of Lampong Bay is mountainous and unindented, while the western side is much cut up ; Telok Betong, its port, has a good harbour, and deals with almost all the trade of the Lampong districts.

Geology

The western mountain system is composed for the most part of Archaean rocks, crystalline schists, folded gneiss, and metamorphic limestones, cross-seamed by igneous intrusions of various ages and containing here and there longitudinal bands of Jurassic and Cretaceous rock (Sarolangun) let down by faulting, which were laid down before the folding and are now preserved in the synclinal valleys and faulted areas. The continual erosion of the ranges exposes their mineral contents when they occur, and carry some of these downwards to form 'placer' diggings (Menangkabau).

The whole ridge is metalliferous, but its riches are imperfectly known. Gold and silver in close association are known to be distributed widely in the residencies of Tapanuli and the west coast around the equator, where there are roads inland, as also in various places further south along the mountain strip. Lead in association with silver, copper, and tin, with the rarer metals antimony, cobalt, &c., may be expected to occur in greater quantities than those known at present.

Connected with this range is a series of marine schists containing fossil fish and plants which yields large quantities of petroleum, of which important supplies have already been found on the eastern borders of the range. Wherever this formation or later coal deposits are ultimately found it is probable that oil will be discovered.

In the stratified rocks the most important mineral is coal, and the fact that the important coal-fields exist in, and are not buried under, the Tertiaries makes the discovery of fresh coal-fields easier and their contents more accessible. The coal deposits are of great importance and extent. In the Lampong district of South Sumatra there is a coal basin of Eocene age resting directly upon granite which is over 11 square miles in extent. Inland from Padang on the west coast is the Ombilin field, also Eocene, in three divisions, extending over 35 square miles and containing over 300,000,000 tons of coal. Other coal-fields of Miocene age are found in Benkulen, while the later Miocene and Pliocene coals are widely distributed, and these when metamorphosed by heated rocks are improved in quality. The iron deposits in Sumatra are scarcely exploited. Where iron is only used for making primitive tools and weapons there is no incentive to large production, although the mines are worked in the Lampong district near the southern ports and coast in association with the coal.

The igneous rocks may be considered in three aspects—in the crystalline plutonic form, in their metamorphic results, and in the volcanic enrichment of the soils when weathered and distributed.

The crystalline rocks are the granites, basalts, and their allies. They are of various geological ages, and their values depend upon their local textures, hardness, and ease of working. They are exposed by denudation or pushed through by intrusion.

This intrusion in mass, or through fault cracks, causes change in various sedimentary rocks. Sandstone is changed into quartzite; limestone (coral or otherwise) into varying marbles; and clay or shale under pressure into roofing and flooring slates. All these are found in various places where exposed and preserved along the western ridge, especially in the south.

The geological surface formations of the island run along its length in parallel strips. The igneous and metamorphic are along the western mountain ridges, the Tertiaries with coal, &c., upon their flanks eastwards gradually descend to the lowlands and broaden out widely in the south and in the north, but are restricted and buried under volcanic matter around and east of Lake Toba. Overlying this band a broad covering of quaternary and recent alluvium of great richness and ferti-

lity runs regularly along the island to the coast, and reaches the much indented coast, which is rapidly advancing seawards, thus tending to fill up the straits and join the island to the Malay Peninsula. This alluvium is the weathered and transported result of the slow destruction of harder rocks, and of the distribution of volcanic ejectamenta.

The ejected volcanic products blown over the land by wind or carried down by rivers gradually become a very fertile soil. Connected with volcanic activity is the presence in the neighbourhood of all the volcanoes of sulphur, naphtha, alum, and saltpetre.

The torrents from every part of the ridge of Sumatra constantly carry down material which is spread over the lower lands to the east. These quaternary soils are derived from every kind of rock and vary accordingly. The mountain slopes, particularly those of late volcanic origin, the diluvial tuff plateaux, and the soil from the weather-beaten slate and limestone are all specially suitable for agriculture. The diluvial plateaux are the best cultivated and most thickly populated. The hill-country on the eastern side of the mountains, which is thickly wooded and consists largely of laterite and quartz sands, is not considered in general remarkably good agricultural land, though the laterite is often very fertile, and there are many stretches of good soil often lying at the foot of the volcanic peaks. The inland freshwater marsh-country is at present of no account for agricultural purposes ; it is largely uninhabited. The mud-banks at the river mouths would be of more value if reclaimed by drainage.

ISLANDS ADJACENT TO SUMATRA

(a) *West Coast*

A chain of islands, some of considerable size, extends, as already stated, along the west coast of Sumatra, rising from the edge of the submarine platform or continental shelf. The principal members and groups of this chain will be briefly dealt with from south to north. None is of great importance. Engano, the most southerly group, consists of one large and six small islands, almost entirely surrounded by reefs, which make landing impossible except at one or two points. The islands yield good timber and coco-nuts. The Mentawai

group includes the Mentawai Islands proper, the Pageh or Poggi Islands, and others, some seventy in all. They are of volcanic origin and subject to earthquakes. Sunken coral reefs lie off them and render them dangerous to approach; the shores are mostly flat and often marshy, and the islands are covered with low wooded hills and are little known. The same applies to the Batu Islands, excepting some of the smaller, especially Tello, where a copra trade has been established, largely by Chinese. Nias is the largest and most thickly populated island in the West Sumatran chain; its coasts are rocky or sandy, and landing is often dangerous; the island is hilly and subject to earthquakes. Inferior coal and a little iron and copper are found, and according to Malay traders there is gold on the east coast. The Banyak Islands are a group of 66 small islands north of Nias bearing many coco-nut palms. Simalur, the northernmost of the islands in the West Sumatran chain, is about 54 miles long, and hilly, with rocky, reef-bound coasts. There is coal on the island, but so widely scattered that it has not paid to work.

(b) *East Coast*

Banka.—The neighbouring islands of Banka and Billiton (below) are two of the most important of the smaller islands in Netherlands India, on account of the tin which is worked in them (see pp. 352 *seq.*). Banka, which has an area of 4,377 square miles, lies off the south-east coast of Sumatra. There are large shallow bays on its east and west coasts, and a deep inlet, Klabat Bay, running 19 miles into the land, on the north. Ships can only anchor off the mouths of a few of the rivers in this bay, since the water is shallow, and it is surrounded by inaccessible cliffs. The number of anchorages is small on the coasts, which are partly steep and rocky, and partly low and marshy or sandy, and there are in consequence few coastal settlements. There are about 70 islands adjacent to Banka, all very small, except for Lepau (128 square miles) and Pungoh (31 square miles), both off the south-eastern coast. Banka is mostly undulating hill-country, with salient groups of mountains, the highest point being Bui (2,300 ft.) in the north of the island. There are many rivers, but they run in deep valleys and ravines in their upper courses, and mostly carry little water, particularly in the drier time of the year, so that there is some-

times a shortage of water in the tin-mines. Most of the rivers form extensive marshes in their lower courses, which stretch for miles on the coast along Banka Strait, and they have often a bar at the mouth. Many of these rivers are nevertheless navigable for a considerable distance (about 18 miles in the case of several), owing to the fact that they flow in what were once inlets of the sea, and the tide is still able to penetrate a considerable distance up them. The most important are the Sungei, Jering, and Banka Kotta on the west coast, the Kurau and Batu Russa on the east coast, and the Layang and Antang in Klabat Bay.

The whole of Banka is covered with thick tropical vegetation, and grass plains are rare, but the virgin forest has almost disappeared owing to mining and agricultural operations, and its place is taken by young and comparatively worthless timber. Pepper is grown in increasing quantities by the Chinese.

Billiton.—Billiton lies between Banka and Borneo, between $107^{\circ} 31'$ and $108^{\circ} 18'$ E. long., and $2^{\circ} 31'$ and $3^{\circ} 16'$ S. lat. It is roughly square in shape, and has an area of 1,774 square miles; there are 135 small adjacent islands, with an area of 95 square miles, which are separated by narrow and mostly unnavigable channels. Most of the island lies less than 130 ft. above sea-level, with groups of hills, of granite or sedimentary formation, rising from the flat or slightly undulating country. The coasts are, on the whole, low and monotonous, with extensive marshes, the north coast being higher and more rocky, the highest peak being Tanjem (1,673 ft.) in the centre of the island. The water-supply is very evenly distributed; good water is obtainable from the rivers inland and by sinking shallow wells on the coast. The largest river is the Cheruchup, 1,300 to 1,600 ft. wide at the mouth, which is barred by a sandbank; it is tidal for 7 miles, and is navigable as far as Cheruchup village. There is good anchorage during the south-east monsoon, but a heavy sea in the westerly monsoon. Nearly the whole island is covered with young forest of 20 or 30 years' growth, primaeval forest only being found in isolated spots, but in the centre of the island there are treeless plains covered with *alang-alang* grass.

Riouw-Lingga Archipelago.—The Riouw-Lingga Archipelago consists of five groups of islands lying off the east coast of Sumatra to the south of Singapore; the Karimon group, the

Batam group, the Bintang group, the Lingga group, and the Singkep group. The axis of most of the islands of the last group runs from north-west to south-east, and they are being gradually joined together in some cases by coral and alluvial formations. All the islands of this archipelago vary very much both in area and in height above the sea; whilst the smallest are rocky crags or coral reefs, Bintang, the largest, has an area of about 21 square miles, and rises to a height of 1,235 ft. The islands have been little explored, though the sea-channels are well charted. The sea currents and the growth of coral, however, are constantly changing the shapes of the land and the conditions in the channels. The islands consist mostly of granite, gneiss, slate, &c., and of flat stretches of soft clay or sand, often with fertile soil towards the centre of the island. Lingga is intersected by a chain of mountains, the highest peak being about 4,000 ft. high. Singkep is mountainous in the north-east, whilst the coasts and the rest of the interior is marshy. The Batam islands are hilly, but do not as a rule rise above 200 to 300 ft. The vegetation is rich, the hills being covered with forest.

BORNEO

Borneo, the second in size of the islands of the Malay Archipelago, of which over three-quarters of the total area belongs to the Dutch, is intersected by the Equator, and extends from 7° 3' N. lat. to 4° 10' S. lat. In the north the Kapuas mountain range and its continuation north-east provide a natural division between the Dutch possessions and the British protectorates of Sarawak and Brunei and British North Borneo. The general trend is from south-west to north-east, but at the western end the mountain chain makes a wide curve and terminates almost at right angles to its general course in Cape Datu, and at the eastern end there is no very clearly defined frontier: at various times claims by both nations on the eastern coast have conflicted. The frontier is now fixed at 4° 10' N. lat.

Surface

It is held that the principal mountain features of Borneo were impressed upon it while it was still part of the mainland. It stands upon its continental shelf enclosed, as in a cup, by

the volcanic ridge of the islands which surround it. Borneo itself contains no active volcanoes, but there is evidence of a previously existing group of small volcanoes in the Montrado district, about 40 miles inland from the most westerly point of the island.

The backbone of the island is the Kapuas range, from which other mountain ranges radiate, terminating in the chief promontories of the island, and separating the river systems of the Kapuas, the Barito, and other rivers which reach the Java Sea, the Kutei, the Bulungan, and the rivers of Sarawak. Of these mountain systems the Kapuas is most definitely a range, though it is broken by intervals of much lower elevation; the others, so far as exploration has ascertained, are by no means continuous, but are really high elevated masses parted like islands by comparatively low depressions. The nodal point in the centre is Mount Tebang, which reaches a height of 6,000 ft.

Borneo may be divided into mountain-land, hill-land, plateau, and marsh. The mountain-land rises to heights between 3,000 and 5,500 ft. as a rule (the highest mountains of Borneo are in British territory). Tongues of hill-land project between the isolated mountains. The hills are an aggregate of rounded or extended masses, often with very steep sides, and their average height is from 200 to 300 ft. The hill-land sends spurs into the low-lying plains, which are of great extent, especially in South Borneo. The dry flat land on the borders of the plains gradually passes into the marshy plains of the swamp-land. Deposits of alluvium are brought down by the rivers and extend at times to a depth of 600 ft., while they project into the sea with deltas of great size. The constant equatorial rains cause persistent denudation, which gives the mountain-land its characteristic features. Disconnected peaks and table mountains with gigantic platforms are dotted about the mountain area either singly or in groups, especially in the Müller Mountains which lie south of the Kapuas River, and the Schwaner Mountains still farther south. The Berauw ridge radiates from the centre to Cape Mangkalihat. The Tana Laut ridges, which part the river basins of the Barito and Kutei, terminate in Cape Selatan, and the Schwaner mountains, which throw off parallel ranges separating the basins of those rivers which flow into the Java Sea, after a considerable reduction of height, approach the sea at Cape Sambas in the south-west corner of the island.

The bulk of the country is covered with dense forest, through which the rivers are the only means of communication, save in the higher ground, where there are game-tracks.'

Rivers

The longest of the many rivers in Dutch Borneo take their rise from the region of Mount Tebang in the centre. Nearly all have the same characteristics ; they have first of all a rapid fall through a mountain region in which waterfalls and rapids are common ; then follows a tortuous course with many meanders across the plain-land, after which the river begins to form a delta, or channels of intersection are made between one river and another. The rivers, as a rule, are tidal and navigable for a considerable distance, but few can be approached from the sea because of the sand-bars or mud-banks which form at their mouths. Many of the tributaries also are navigable for a long way by *praus* and other native craft. Some special features of the rivers of this country are worthy of note. The natives apply the name *karangan* to the accumulations of material deposited by running water in the beds of rivers, and these are constantly found in the rivers of Borneo, whether as promontories or islands ; the end that faces up-stream is always of finer material than the rest, and the higher course of the stream contains rough boulders, while the lower course has pebbles, sand, and mud. The *pintas* and *danau* are two constant features of the rivers of Borneo, especially of the Kapuas and the Kutei (Mahakan). When the river is flooded, it cuts for itself a new way across the neck of the loops upon its course ; these short ways are called *pintas* (or *pintassans*, also *antassans*). The old course is apt to become a *cul-de-sac* with one or more lakes in it ; to these, as well as the lakes on its main course, the name of *danau* is given, and in parts of the course of the Kapuas a chain of these lakes is found parallel to the stream. The equatorial rainfall produces so many floods that the rivers are constantly changing their course, and difficulties are created for navigation, especially as the whole country is so much overgrown by dense forest that it is impossible often to see where the river is flowing, and fallen leaves and débris make frequent obstacles on unfamiliar routes. Canalization is needed along those rivers, like the Kapuas, which are most tortuous.

The greatest river in the west is the Kapuas (Kapoewas), the basin of which occupies the bulk of West Borneo. Like the other chief rivers, it rises near Mt. Tebang. Its basin is 37,000 square miles in area, about equal to that of the Rhine, and its length has been computed at 810 miles; it has twenty-two big tributaries, the largest of which is the Melawi, which joins it at Sintang. Above Semitau there is a district of lakes, some of which are of considerable size, but at that point the river flows through a gorge. For a great part of its course the Kapuas is flanked by banks 5 to 7 ft. high, behind which there is lower-lying ground, often inundated forest-land. In the delta the mouths of its distributaries are 15 miles apart; on the northernmost is Pontianak, the capital of West Borneo. Of the other rivers of this coast the Sambas is worthy of mention, because it offers no serious obstacle to navigation (see Chap. XII, under heading *River Transport*).

On the south coast there are many rivers, most of which rise on the eastern side of the Schwaner Mountains, but after flowing east for some time, make a curve and take a southern course to the Java Sea. Of all these the Sampit is the only large river which is not impeded by a mud-bar at its mouth.

The other chief rivers of the south coast are navigable for a considerable distance when the difficulties of the mouth have been surmounted. The mouths of the rivers are usually broad, but shallow, and some can only be entered at high water. The principal rivers are the Mendawai, the sinuous Kahayan, and the Barito. The Barito has many important tributaries which are themselves navigable, including the Negara and the Martapura, on whose banks is Banjarmasin. The Barito is second only to the Kapuas in length. It is liable to very extensive inundations; during the wet season 580 square miles—more than one-third of the entire river basin—are flooded; in the dry season there is left a black soil traversed by numerous channels.

The chief rivers on the east coast are the Kutei (Mahakan), Berau, and Bulungan. The delta of the Kutei projects eastward for 20 miles, and has four large navigable outlets. In its middle course it has a large area of *danaus* resembling that of the Kapuas. The Berau has a large uninhabited delta with many islands, and two principal mouths that carry vessels of 13 to 15 ft. draught at high water. The River Bulungan, navigable

for a considerable part of its course, is especially noted for its rapids, which are the most formidable in Borneo; the Bem Brem rapids are more than 11 miles long. Farther north the Sesajap and the Sibuko are the most important streams.

The bridges made by the natives are ingenious but unsubstantial structures of bamboo and rattan with a hand-rail; they usually take advantage of the presence of some big tree.

Coast

From Cape Datu to the mouth of the Sambas the coast is chiefly sandy; thence to the Kapuas delta it consists of mangrove swamps. As far as Cape Sambas it is very sparsely inhabited. The southern shore has the same uniform features throughout; at some places there are sandy beaches, but as a rule the vegetation comes down to the sea; the coast is marshy and practically uninhabited, a few inhabitants being found in the coco-nut plantations, but even the small villages lie inland as a rule. The rivers are usually barred; those with a small volume of water make funnel-mouths; those of greater size form rudimentary deltas like the Katingan, or, by cross-communications, form a sort of inland delta, as do the Barito, Kapuas, Murung, and Kahayan, that does not project into the sea. The absence of deltas of importance on this coast is probably due to the strong currents which flow all the year either east or west parallel to the coast.

On the east coast the southern part has high forest which reaches the sea. Beyond Cape Dewa northwards it is marshy, but south of Cape Aru and between Balik Papan and the delta of the Kutei, and farther north between the Berau and Bulungan, there are sandy beaches, while in the neighbourhood of Cape Mangkalihat the coast is here and there rocky. Along the whole of this coast there are few prominent landmarks, the coast hills seldom coming within six miles of the shore, which is low, swampy, and covered with vegetation. At the river mouths the vegetation (largely *nipa* palms) is taller than along the rest of the coast.

On the southern shore the discharge of the rivers during the western monsoon is very great, and discoloured water, edged with a streak of foam, is frequently seen 30 or 40 miles out at sea.

The coast is badly provided with harbours that afford safe anchorage ; as a rule the bays are wide and open, and provide little security. Such harbours as exist are at the mouths of rivers, but the excellence of the harbour bears no relation to the length of the stream, the better harbours on the east coast especially being, like Balik Papan, at the mouths of comparatively short rivers. The harbours on the greater rivers are usually some distance (from 12 to 25 miles) up stream. As a rule the coast is flat and marshy, with mangrove swamps, and overgrown with impenetrable forest. It seldom rises many feet above the sea except where the mountains approach the shore. The sea is shallow, and reefs extend frequently a long way out to sea, especially along the southern shore.

Geology

The location of the various geological formations of the island may be referred to the physical divisions outlined above. The view here adopted is that of a stable mass having a definite north-east and south-west trend in its fracture lines with a crumpled mountain ridge in the western half, followed by foothills which sink into plains, and these into swamps. The island is regarded as an old crust block, ridged, fractured, folded, and faulted, with sunk lands merging into the depressions of the Celebes and Sulu Seas. The trend line is indicated by the main Kapuas range. This trend is continued through the Palawan Islands to Manila, and through the Sulu Islands to Mindanao. The east-and-west Berauw ridge is the boundary between two sunken areas fringing the depression of the Celebes Sea and the rift of Makassar Strait. This ridge is fractured across in the straits but continues through northern Celebes. The main trend is again indicated by the ranges of Martapura, in Banjarmasin, in the south-eastern corner of the island.

The whole island is characterized by intense folding, and the closed folds are extensively fractured by mass faults. Through these faults and fissures rise dikes and veins of igneous rock, forming sills, bosses, laccolites, and transgressions of basic rock, while the more acid granites and their allies are now exposed as hard central cores where they originally accumulated as batholites, reservoirs, or deep, broad injections. The whole

crusted mass is thus stiffened and consolidated, and has lost its plicability. The result is twofold. The table-mountain structure (Müller Mountains) and the basin and range structure (Bisar Highland) are dominant. High mountains like Kina Balu in the north have a horst or step structure. Isolated disconnected peaks in groups or singly (Semitau) are dotted over the mountain area, their contour lines corresponding closely to their exposed central core and the later rocks upon their flanks.

The constant equatorial rains produce persistent and vigorous denudation which, acting upon this block-structure, results in a confused assemblage of rounded heights and hollows wherever strong faulting has not produced dominant peaks and ridges.

It has been suggested that Borneo was what Celebes is—that the whole island has been raised until the low-lying land intervening between the high ridges took the place of gulfs of the sea, such as those which now separate the ridges of Celebes. The above account of the structure of the island does not support this theory.

The 'mountain land' of Borneo is composed of crystalline schists, phyllites, older eruptive rocks, and 'old slate' (possibly Devonian). On the south side above the Kapuas River it is faulted downward extensively in a general east-west direction. Below this mighty fault are great bands and ridges of Jurassic marls, limestones, and occasional diabase tuff with beds of jasper and radiolaria.

South of this a broad band similar in direction is again faulted downward and lies like a broken ribbon of Cretaceous (Cenomanian) rocks much folded and contorted. This band, however, does not adjoin the Jurassic save where occasional faulting is irregular, but is bounded along its length by Tertiary strata which also lie in patches upon the Cretaceous central ribbon. This ribbon extends eastwards to the Kapuas water-parting. The Tertiary beds are immense horizontal masses of sandstone faulted and denuded into table-mountains. Farther to the west, south of Sarawak, the faulting is in a network, more close and complicated, with many igneous intrusions, trending generally north-east and mingling Archaean, Jurassic, and Tertiary rocks in disorder with igneous intrusions of varied age. First, then, we have the schistose mountain land, then the varied formations of the Kapuas plain, and then south of

this rises an enormous area of entirely igneous rock crossed by the Equator and extending in a broad rounded exposure in every direction for nearly 200 miles and covering 40,000 square miles of surface.

The northern edge of this mass is called the Müller Mountains. It consists in the west of isolated andesite mountains, and is continued eastward by tabular masses of volcanic tuffs 4,000 ft. thick containing silicified tree-trunks *in situ*, and these by volcanic hills of very acid lavas. This great igneous area is therefore of very varied composition. The schists of the mountain land belong to various ages and are largely metamorphic.

The mountain land, composed of rocks older than the tertiaries which are stiffened and often metamorphosed by igneous contact, extends in isolated outliers protruding through the tertiaries which are below them in height, above them in sequence. These Tertiary beds in the hill land are superposed in the following order. The lowest or breccia conglomerates are followed by the sandstone stage of great development and thickness containing important beds of Eocene coal. The third or marl stage with fossils, is succeeded by the highly fossiliferous limestone stage.

Flanking the wet flat land in a belt and penetrating between the Tertiary spurs, on the sides of which it is often left in the form of horizontal terraces, comes what is called diluvium, to distinguish it in age from the more recent alluvium that follows it. The diluvium, partly marine, partly fresh-water, forms a slightly undulating plain of solid clayey, sandy, and pebbly beds, containing platinum, diamonds, gold, and iron in abundance, indicating the richness of the rocks from which it has been derived. Following the diluvium in age are all the more recent deposits, some of which are still in process of formation, derived from the denudation of all the slopes above them, and forming the lower-lying soils. These are of very wide occurrence along the great river valleys of southern Borneo. There are three types of alluvial deposit in Borneo—recent marine, fluvial, and recent coral formations. The marine are typical shore-formations of no great extent. The widely-spread fluvial deposits, sometimes 40 miles across, are dark brown, black, or bluish clay, rich in humus in the upper, harder in the lower layers. In some cases the alluvium is over 600 ft. thick.

ISLANDS ADJACENT TO BORNEO

Karimata Islands.—The Karimata Islands lie off the west coast of Borneo. They are peopled with settlers from Singga and Siak, who are occupied in fishing and in working the iron found in Great Karimata.

Anambas, Natuna, and Tambelan Islands.—There are some 300 islands lying in the China Sea between the Malay Peninsula and Borneo, and forming part of the Riouw-Lingga Residency; they are divided into the Anambas Islands (96 small islands); the Natuna Islands (55 islands), subdivided into the Great Natunas (of which the principal island is Great Natuna, about 40 miles in length, most of which is covered with forest), the North Natunas, and the South Natunas; and the Tambelan Islands (40 small rocky islands, of which Tambelan is the biggest). Most of the larger islands are mountainous, and there are many short rivers, navigable for boats at high tide, and natural harbours.

Pulu Laut.—The chief island in close contiguity to Dutch Borneo is Pulu Laut, off the south-east corner of the island. It is 55 miles in length and 20 miles in breadth. It rises at its northern end to 2,300 ft. The island is densely wooded. Its principal importance is that it possesses coalfields in the north, where the mines are chiefly worked by natives, the centre of this industry being Simbimblingan.

CELEBES

Form and Surface

The island of Celebes extends from $1^{\circ} 45' \text{ N. lat.}$ to $5^{\circ} 37' \text{ S. lat.}$; its westernmost point, near Cape William, is in $118^{\circ} 49' \text{ E. long.}$, its easternmost by the Limbe Strait is in $125^{\circ} 5' \text{ E. long.}$ From the backbone of the island which runs north and south for above 450 miles there project three long peninsulas, running respectively north-east, east, and south-east, the first of which is considerably the longest. Three deep gulfs are thus formed on the eastern side; these, from north to south, are the Gulfs of Tomini or Gorontalo, Tolo, and Boni. The whole island from the extremity of the north-eastern peninsula is almost 800 miles long. Its length is disproportionate to its breadth, which is on the average between 36 and 120 miles, narrowing

at one point to 18 miles. No place in it is as much as 70 miles from the sea.

The whole island is mountainous, and individual mountains such as Mt. Batang (or the Peak of Bonthain) in the extreme south, and Mt. Koruwe in the centre of the island, rise to more than 10,000 ft. In the extreme north-east and south the mountains are volcanic, some in the former being active, and solfataras and hot springs being found in Minahasa, the district of the extreme north-east, while Una Una, an island in the Gulf of Tomini, has been in eruption in recent years.

The part of the island that runs north and south has two parallel ranges in its southern extension, with a longitudinal valley between, constituting the basin of the River Walannæ which drains into the considerable Lake Tempe. The western mountain range terminates in the great mass of Batang, the eastern is continued across the Saleier Strait into the island of Saleier. Between the western range and the sea is an alluvial coast plain from 7 to 30 miles wide, but throughout the island there is little alluvial plain, for the rivers have only short courses, and, with few exceptions, the sea is deep in the immediate vicinity of the coast, the 100-fathom line coming at many points within half a mile of the shore. North of the central block the elevation of the mountains is lower, and there is only one ridge of mountains, which is crossed near the Equator by low-lying land, through which a canal might be dug. In the western part of the central block are a series of alternating mountain ridges and intervening plateaux which run down in parallel lines to Cape Mandar.

At Cape Dondo the line of the mountains alters its direction. The north-east peninsula at first runs west and east, and consists of ridges that do not follow the coastal trend but run obliquely from south-west to north-east. The granite formation of this part produces the characteristic soil with swamps and bogs in the hollows and loose débris on the hill sides. After continuing for more than two hundred miles in this direction the peninsula turns to the north-east, and the volcanic region of Minahasa begins. This is the most mountainous part of the island, though the mountains are not so high as in the centre and the south, the highest, Mt. Klabat, at the extreme north-east end of the island, being 6,560 ft. high. The mountains which through Gorontalo (the west-and-east portion of the

peninsula) are divided by valleys in regular sequence no longer show the same system, but the river valleys radiate in different directions from the volcanic cones. The volcanic activities of this region have had a great effect on the fertility of the soil, and the forests there are uniformly luxuriant.

In the east and south-east promontories the mountains sweep round in concentric semicircles from the island of Peling to the island of Buton. The south-east promontory has much the same characteristics as the southern peninsula. Parallel mountain ranges along the two coasts bound a swamp of no great breadth which lies along the sea. Through the peninsula there is another rift in which lie the principal lakes of the island, Poso, Matana, and Towuti, and farther south the swamp of Lake Opa. The principal rivers of the peninsula flow down longitudinal valleys, and either form basins of inland drainage or break through gorges to the sea.

The eastern peninsula is little known. Along the south coast lie the Tokalla Mountains, more than 8,000 ft. high. It shows for the most part the same features as the south-east peninsula, of coastal mountains, a lower central plateau, and a higher mountain system.

Much of the island is covered with forest, especially round the Gulf of Tolo. This is penetrated by scarcely perceptible paths. The vegetation grows up the precipitous and almost vertical mountain slopes. The rift valleys are extremely fertile.

Lakes

The principal lakes lie along the rifts between the parallel chains of mountains. In Minabasa is Lake Tondano (2,000 ft. above the sea) with a length of 9 and width of $3\frac{1}{2}$ miles. The recently discovered Lake Ililoi is merely an expansion of the River Poigar. In Gorontalo are Lakes Limboto, Batudaka, and Bolano Sawu. In the central nucleus of the island is Lake Lindu, drained by the River Gumbasa nearly northward into Palu Bay, on the west coast; farther south in the same longitudinal rift are Lakes Tempe and Sidenreng, monsoon-lakes, which almost dry up during the dry monsoon, leaving tracts for the cultivation of rice and maize. East of this, along a somewhat similar but wider depression, are the chief lakes of the island, Poso, Matana, and Towuti. These are very deep

rift lakes, Matana having been sounded to 1,500 ft., and Poso to 1,000 ft. In addition to these there are many smaller lakes of various types—shallow lakes on the plateaux, numerous in all parts of the folded mountain areas, crater lakes in the south and north-east, solfatara lakes with hot springs, and temporary lakes or swamps, with or without outlet, which dry wholly or in part in the dry season.

Rivers

The rivers of Celebes, owing to the shape of the island, have no great length and are of little importance. Their course is rapid, and their fall great. Waterfalls and rapids are very frequent, the best known being the falls on the River Tondano where it issues from the lake of the same name, which lies 2,000 ft. above the sea. The only rivers of any length are those which run longitudinally. These either collect into basins of inland drainage like the Opa swamp or lake, or break at right angles across the mountain ranges like the Tyenrana which drains Lake Tempe, or the Lariang, which, after flowing northwards under the name of Koro, turns westward and reaches Makassar Strait, or flow into a longitudinal sea-inlet like the Palu. The length of the rivers given in several descriptions of the island has been much exaggerated.

There is little opportunity of navigation on any of the rivers. The Lasolo, one of the chief streams of the south-eastern peninsula, admits steamers for 16 miles from its mouth. The others are only navigable for smaller vessels, and their mouths are almost invariably obstructed by bars. The Jenemeja, which flows into the Gulf of Boni in one of the few parts where there is a coastal plain of any breadth, is a broad river and navigable for a considerable distance from its mouth. The Poso, entering the Gulf of Tomini, is wide and navigable by *blottos* up to Paluasi, but is full of rapids above. The Sadang, entering the Gulf of Mandar on the south-west coast, has many affluents and is navigable by *sampans*. The rivers of Gorontalo (Poigar, Bone, Buol, &c.) are only navigable by native craft for a few miles. The Walannae flows into Lake Tempe, and both it and the Tyenrana, which flows from that lake into the Gulf of Boni, are navigated for many miles by native vessels.

Coast

Borneo stands in a shallow sea on a shelf that projects from the continent of Asia ; * New Guinea, in a similar sea, on a similar shelf projecting from Australia. Between them Celebes is situated in a very deep sea, the only part of which that is at all shallow is the southern part of Makassar Strait, where lies the Spermonde Archipelago. For most of the rest of the island the 100-fathom line comes very near the shore, being seldom more than 4 miles distant, except at the head of the gulfs, and sometimes within half a mile. It is, generally speaking, a dangerous coast, fringed by drying coral reefs, and with many shoals and banks in the narrow strip of water short of the 100-fathom line.

In consequence of the three deep gulfs of Tomini, Tolo, and Boni, Celebes has an immense length of coast in proportion to its area. The coast-line is more than 2,000 miles in length. Each of the peninsulas is continued by groups of islands, which are described below.

As a rule the mountains come very close to the sea, and the strips of coastal plain are narrow, the most considerable being that of Luwu at the head of the Gulf of Boni, where the shore for some considerable distance is low and flat. Other parts with similar characteristics are the neighbourhood of Makassar, where the interior is hidden from the sea by the trees and villages which fringe the coast and the plain of the River Tangka near Sinjai. In parts, as in the region north of Palu Bay, the coast is high and heavily timbered, with rocky points and sandy beaches. In other parts, as by Cape Toli Toli and along much of the north coast of the Gulf of Tomini, swamp takes the place of sand, and mangroves instead of forests line the shore. The reefs which fringe the coast often enclose many small islets, as in Mengkoka Bay and many parts of the Gulf of Tomini.

The deeply indented coast with the numerous reefs and other dangers to navigation are a great hindrance to the coastal trade, and the island is not endowed with a great number of natural harbours. The best are : on the north coast Menado Bay, a good port except in the months of December, January, and February, when it cannot be used, but when its place can be taken by the port of Kema, on the east of the island ; Amurang Bay, which is 9 miles across and penetrates the land 9 miles ;

Kwandang Bay, a wide bay with islands ; and Dondo Bay (13 miles long), of which the western shore is very steep, although it is shallower under the east shore. On the western shore of the island is Tambu Bay (13 miles across at the entrance and 17 miles long) ; Palu Bay, which penetrates 19 miles and is 3 to 4 miles in breadth, and contains Donggala as its principal port, the centre of the trade of the district ; and Pare Pare Bay, which is 4 miles long and divided into two parts by a narrow passage. Makassar, though the principal port in the island, is in a dangerous part of the coast, and its approach needs careful navigation.

In the Gulf of Tomini, Gorontalo has an excellent harbour, the mouth of the river being very deep ; the other chief bays are the wide bay of Poso, and the Gulf of Poh, which penetrates eastward about 22 miles. The whole of the Gulf of Tomini outside the 100-fathom line is very deep, but storms are rare and the currents are weak, and though there are few spacious anchorages, there are numerous sheltered places along the coast.

The Gulf of Tolo has some important bays, including at its head Tomori Bay, which is 5 miles wide at the entrance and penetrates 20 miles, and contains inside it many smaller bays ; and Kandari Bay, which runs 4 miles inland, gradually increasing in width, and containing good anchorages, sheltered as it is from winds by the high surrounding hills. Staring Bay, just to the south, is of considerable extent, but has not been examined.

The western shore of the Gulf of Boni is in great part fringed by reefs, and on the eastern side the same feature makes certain anchorages, such as Mengkoka Bay, largely inaccessible. At the head of the gulf, fringed by the low alluvial plain of Luwu, is Palopo Bay, and to the east of it Usu Bay. Near the south-eastern extremity of the gulf is Sopang Bay, which affords anchorage for vessels of moderate size.

Geology

The broad central block of Celebes, from which the peninsulas project, stands midway between the two rifts of Makassar Strait and the Boni depression. It is a complex of igneous rocks, with granite, gneiss, diorite, and amphibolite characters,

pierced here and there by later eruptives, for the most part Tertiary.

This block is enclosed around its base by Cretaceous rocks overlaid by tertiaries and recent alluvial deposits towards the coasts. Around the south-eastern corner of the block, both along the coast and inland, there is a broad band of pre-Tertiary tuffs, fringed occasionally by the coral limestone known as *karang*. The northern part of the Gulf of Boni is widely bordered by pleistocene and alluvial deposits, resting in the north-east upon late tertiaries, but in the neighbourhood of Paloppo there is a band of old plutonic basic rocks. This band fringes on the east a series of parallel faulted folds of Cretaceous and Tertiary rocks through which protrude axial belts of metamorphic rocks and schists. Eastward of the band itself, across the Gulf of Boni, the same plutonic rocks reappear, and extend across the south-eastern peninsula, enclosing Lake Towuti, to the Gulf of Tolo.

The meridional ridge of Celebes, which runs north and south parallel to the west coast, has an axis of crystalline schist, tourmaline quartzite, and glaucophane schist, penetrated and overlaid by andesite and basalt. The whole is flanked by tuffs which make a fertile strip along Makassar Strait, and are in turn overlaid by the late Tertiary *Orbitoides* limestone, which forms an inland cliff.

The southern extension from the central block has been the scene of crustal and volcanic disturbance, resulting in the depression of the Walannae and Lake Tempe, and in the formation of the Batang volcano. The predominant north-and-south direction of the faulting is evident here, and the dislocations have raised the late Tertiary limestone in some parts to a height of more than 3,000 ft., while elsewhere it appears at sea-level in contact with the present coral reefs. Portions of the Archaean foundation are revealed here and there.

Eastward of the central block, from the head of the Gulf of Boni northward to Parigi at the head of the Gulf of Tomini, there is a marked fault line bounding the igneous complex of the central block. This faulted and depressed area contains Lake Poso. It is composed of crystalline schists and metamorphosed shales, with gneiss and metamorphic limestones, while a triangular area north of Lake Poso consists of late tertiaries fringed with alluvium, and elsewhere there are old

lake-basins filled with alluvium, and swamps partially filled. The fault is bounded on the east by the old plutonic rocks already mentioned as appearing on both sides of the head of the Gulf of Boni.

The south-eastern and eastern peninsulas may be considered in the main as a broken crustal block with plutonic rocks, somewhat similar to, but older than, the western block, and more dislocated. The exposures known from the north Banka coast, southward past Lake Towuti, to the detached islands on the east coast are similar in character, these plutonic basic rocks being of pre-Tertiary age. Running south inland along the Gulf of Boni the Lake Poso metamorphics are continued through Kambuna Island. This band is faulted eastwards, and then appears a series of Pleistocene to recent rocks passing over to the north of Muna with no tertiaries except a small patch in the south of Buton Island. Around Mengkoka Bay (midway on the eastern shore of the Gulf of Boni) is a fringe of coral limestone (*karang*) which borders Kabaena north and south, covers more than two-thirds of Muna, all except the centre of Buton, and all Wowoni with the small islands north of it. The south-eastern peninsula is otherwise little known. There are indications of Jurassic rocks south of Lake Matana and these are known also in patches in the eastern peninsula, of which the base is composed of the old plutonic rocks fringed by tertiaries, and, along the sea border, by recent rocks. The metamorphics reappear in Peling Island and are fringed by *karang*.

The north-eastern peninsula, in that portion which lies west-and-east, is sharply divided structurally into northern and southern belts. The northern belt consists mostly of sedimentary rocks, Cretaceous or Tertiary, some altered by metamorphism, with later denudation products in the valleys. This belt runs parallel with the north coast and is separated by a parallel fault line from the southern belt, which consists of granites, gneisses, and intrusives, with Archaean schists and altered rocks caught in faults. The faulting is rectangular, so that the western portion stands as a horst block that sinks by a series of steps to the depression of Lake Limboto. The valleys are filled with sediments according to their age, but for the most part with recent deposits. Older rocks, Cretaceous and Tertiary, are preserved in occasional east-and west bands, and

in places near the south coast there are fringes of *karang*. The north-eastward prolongation of Minahasa, as has been seen, is volcanic, and differs from any other portion of Celebes, and its physical features, soil, and drainage are dominated by this volcanic modification. There is a line of old volcanic mountains, and much present solfataric activity such as hot springs, mud eruptions, and sulphur emanations. Small earthquakes are common.

ISLANDS ADJACENT TO CELEBES

Spermunde Archipelago.—The Spermunde Archipelago lies off the west coast of Celebes, north of Makassar, in a part where Makassar Strait is comparatively shallow. It consists of a great number of low islands, surrounded by coral reefs. Coco-nuts are grown, but the sandy soil is unsuited for other produce.

Sangi Islands.—The Sangi (or Sangir) Islands continue the north-east extension of Celebes towards Mindanao; they are set upon a long narrow ridge along the volcanic band, with great depths on both sides of them. They are volcanic, but fringed with recent coral formation (*karang*). Some of the volcanoes are still active, including Mt. Abu (or Awu) on Sangi, which has had recent disastrous eruptions (1892, &c.); there have also been small earthquakes. The most important islands are Sangi, Siau, and Tangulandang (or Tagulanda). Between the last and Celebes, among other islands are Talisse and Banka (not to be confused with Banka Island off Sumatra). The important channel of Banka Passage (see Chap. I) passes to the north of these. Sangi (27 miles long, and 9 to 17 miles broad) is mountainous in the north, but only attains moderate heights in the south. The coast is generally steep: the principal port, Taruna, is visited by steamers. Siau is extensively cultivated with numerous nutmeg and coco-nut plantations; apart from agriculture and fishing, the principal industry is the weaving of Manila hemp. The volcanic soil makes both these islands exceptionally fertile. Tangulandang has two peaks about 2,500 ft., the island sloping from them to the westward. The principal industry is boat-building. Ruang, west of Tangulandang, contains an active volcano.

Talauer Islands.—This group lies to the north-east. The chief island is Karkelong (Karakelang), which is 39 miles long

and 15 wide at the northern part ; the southern part is said to be 2,300 ft. high. The coast is generally steep-to, except on the south side, which is fringed by a reef nearly a mile wide. Several bays, including Esang Bay, afford anchorage. This island is parted by a strait about 1 mile wide from Salibabu, which sometimes gives its name to the group.

Schildpad or Togian Islands.—The Schildpad Islands lie in the Gulf of Tomini. They extend for nearly 80 miles east and west. The chief islands, Talata Koh, Togian, and Batu Daka, are separated by such narrow channels that they practically constitute one island, and the passages between them are difficult for navigation. Batu Daka is rocky and almost uninhabited. The other islands are hilly and densely wooded. Detached from the other islands is Una Una, with an active volcano, the lower slopes of which are very fertile.

Banggai Archipelago.—The Banggai or Peling Islands lie off the eastern extremity of Celebes, to which they belong geographically, though, like the Sula Islands farther east, they belong politically to the residency of Ternate. There are four chief islands, Peling, Banggai, Labobo, and Bangkulu, all inhabited. Excepting part of Peling, these islands are very imperfectly known. They produce good timber, including ebony. Peling is greatly indented, and is a mountainous and wooded island. It has many bays affording anchorage, and others obstructed by reefs. These islands are frequented by fishermen for trepang and turtle.

Islands off the South-Eastern Peninsula of Celebes.—Off the south-eastern corner of Celebes is a group of islands, of which the most important are Kabaena, Muna, Buton, and Wowoni. They are separated from the peninsula by the Tioro and Wowoni Straits, both of which are dangerous. The Buton Strait, between Muna and Buton, is very narrow, but is navigated by those ships that do not go outside the islands. The islands are hilly. Buton, which is over 100 miles long, has a chain of limestone mountains, 600–700 ft. high, along its axis. East of it lie the small Tukang Besi Islands. Muna is less hilly ; it consists of coralline limestone, but the hills run less definitely north and south. Kabaena consists partly of limestone, partly of volcanic hills. Buton is penetrated on the eastern side by a great bay, Kali Susa, with some good anchorages, but full of dangers.

Saleier.—Saleier (or Salayar) is an extension of the eastern mountain-chain in the southern promontory of Celebes. It is about 50 miles long, with a greatest width of 8 miles. It is traversed by a chain of mountains reaching 2,000 ft., which descend steeply to the sea on the east side, and gradually slope to the flat stretch on the west. Its streams can only be entered by *praus*. It is populous and prosperous, owing chiefly to its proximity to Makassar.

THE MOLUCCAS

The name of the Moluccas is here applied in the wide sense defined in Chapter I. It should be observed that the political boundaries do not coincide with the geographical divisions (see Chap. VIII, p. 260, and key-map). The component groups will be dealt with in order approximately from north to south.

Halmaheira (or *Gilolo*).—Halmaheira (= mainland) is not as important as its size would suggest. It is about 200 miles long, and has an area of about 6,500 miles (including the islets close to the shore), but, except in the northern peninsula, it is not thickly populated, and it is not fully known. It resembles Celebes in shape, having four peninsulas that meet at a central point, a long western coast, and three deep gulfs on the east. It is very mountainous, and is in the main of ancient formation. The northern peninsula is mostly occupied by two mountain ranges, between which lies a well-cultivated, undulating plain. The mountains along the western coast are volcanic, and at least one, Gam Kenora (4,922 ft.), is active. The other three peninsulas are intersected by mountain chains, from which spurs extend to the coast; there are summits from 3,000 to 4,000 ft. high. The mountains are thickly wooded. There are numerous rivers, of which the chief are the Taliabu and Kaii, but none is of great importance. There are several lakes. The forests are rich in a great variety of trees.

Morotai (*Morti*).—Morotai lies 14 miles north-east of Halmaheira. It is more than 50 miles long, and from 13 to 26 miles wide. It is high for the most part, the highest point in the Sabotai range being about 3,000 ft. It has numerous rivers, navigable by small boats for some distance inland. On the river banks and in the flat south-west part of the island are forests of sago-palm, and inland many dammar trees.

Ternate.—Ternate is the northernmost of the line of islands off the west coast of Halmaheira. It is the seat of an ancient sultanate and now contains the chief town of the residency that bears its name. The island consists almost entirely of a conical volcano (5,184 ft.) with four peaks, which is constantly active ; it has suffered from many eruptions and earthquakes. Ternate has an area of about 25 square miles and is 6 miles across. It is densely wooded, and on the south and south-east is cultivated. Between the lava ribs are pieces of flat ground planted with rice and maize, and the island also produces sago, coffee, pepper, nutmegs, and cloves, but the last have been unimportant since Amboina was given the monopoly. Between Ternate and Tidore is a fine harbour.

Tidore, &c.—Tidore, the next island, rather more than 1 mile south, was also the seat of a historic sultanate. It is a small mountainous island, of which the southern part is entirely occupied by a volcanic peak (5,808 ft.), with bare top and wooded sides, but no longer active. Below the 1,000 ft. level there is cultivation, especially on the eastern side. The soil is remarkably fertile. The northern half of the island is a rugged mass of hills, descending steeply to the sea with a few level spots near the beach. Fruit, cotton, nutmeg, tobacco, and coffee are grown. The chief town, Soasia, is on the east coast.

The other islands along this coast are Maré, Maitara (or Motir), Makian, and Kayoa, while Taifore and Mayu lie out in the middle of Molucca Passage. Maré is called Potbakkers Island because of the excellent clay found in the south-west of the island, from which the inhabitants make earthenware vessels. Maitara is a temporary habitation for the dwellers in other islands who come here to cultivate plantations and gardens in its fertile volcanic soil ; forests grow up to the summits of the mountains over 2,750 ft. Makian suffered from eruptions in 1861 and 1870 ; it is covered with vegetation over its uneven surface, which rises to 4,166 ft. The inhabitants are engaged in agriculture, tobacco-growing, fishing, and weaving. Kayoa is nearly 10 miles long ; it has a range of hills, rising to 1,181 ft., almost its entire length.

Bachian (Batjan) Group.—To the south of this chain lies the Bachian group, the chief of which is the island of Bachian, 52 miles long with a mean width of 23 miles. This island is very mountainous, the northern part being volcanic ; the

central part, where there is an isthmus, is much lower than the heights to north and south, the greatest heights being at the southern extremity. There are no active volcanoes, but there are sulphurous springs at the foot of Mt. Sibela (7,215 ft.), and Bachian is liable to earthquakes. The mineral resources include gold and copper in small quantities, and coal which is worked intermittently at small profit. The interior of the island is densely wooded and has few inhabitants ; there are numerous streams, but only few can be entered by small boats. Good timber is found.

West of Bachian are Great Tawali (or Kasiruta), 19 miles long and 15 wide ; Mandioli, 17 miles long and 9 wide ; and other smaller islands.

Obi (Ombi or Ombira).—The group consists of Great Obi (or Ombi Major), five smaller islands, and many mountainous islets. It lies to the south of the Bachian group, and serves with the Sula Islands to form a continuous chain between Celebes and New Guinea. Great Obi is more than 50 miles long and 20 miles wide. It is very lofty, rising to nearly 5,000 ft., but not volcanic, being probably composed of ancient crystalline schists. The mountains decrease towards the east, where for 10 miles the ground is low and marshy in places. The whole island, including the mountain tops, is densely wooded. There are numerous rivers which descend steeply from the hills, but have low banks on their lower course ; they can only be entered by small craft, and their mouths are barred. Coal and lignite are found, and there is supposed to be gold. The island has almost no resident population, because it is supposed to be haunted, a reputation which may have been manufactured for it when it was a favourite resort of pirates. The other islands in the group are hilly and have steep coasts.

Sula (Sulla) Islands.—The Sula Islands consist of three of considerable size, Taliabu, Mangola, and Sula Besi, and several smaller ones. The first two of these, together with Lisamatula, form a chain extending east and west about 135 miles. They are high, mountainous islands, thickly wooded, and thinly populated. Taliabu, the largest in area, is little known. It has mountains 3,000 or 4,000 ft. high, and contains hot springs. Mangola, the middle island, is 65 miles long ; it is narrow and generally high ; the highest peak, Mt. Buja, is in the west of the island. Lisamatula, the eastern island, is uninhabited.

More important than these is Sula Besi, which lies to the south. It is thickly inhabited and well cultivated. Coal of an inferior quality is found upon it. The islands produce excellent wood for ship-building.

Buru.—Buru, with Ceram and the Kei Islands, stands upon the outer wall of Archæan rocks which enclose the symmetrical inner volcanic ring to which the Banda Islands and some of the South-western Islands belong. It is an oval island, about 90 miles long and 50 miles wide, with an area of nearly 3,400 square miles. Its chief geological formations are crystalline slate to the north, and mesozoic sandstone and chalk to the south. It is full of lofty mountains, especially in the north-west part, where are Mt. Tomahu (8,524 ft.) and Kaku Siel, not much lower. In the east the mountains are comparatively low. Surrounding Kayeli Bay is a wide, circular, level plain constituting almost one-quarter of the island. Most of Buru is covered with forest, but the north is somewhat bare and overgrown with coarse *kussu* grass. It has many rivers, chief of which is the Wai Apu, which flows through swamp, full of fern. Their mouths, which are obstructed by bars, offer anchorage to native craft; the only anchorage for bigger vessels is afforded by Kayeli Bay. Waikolo Lake, near the centre, 1,900 ft. above the sea, lies at the foot of Kaku Siel; it has been wrongly supposed to be a volcanic crater. In the swampy parts, especially Kayeli, Lisela, and Waesama, many sago palms grow. There is good timber, especially teak, ebony, and kanari. Ambelau Island lies off the south-east coast.

Ceram, &c.—The island of Ceram lies east of Buru, and is divided from it by Manipa or Buru Strait, in which are several islands, including Manipa, north-east of which are Kelang and Boano. Ceram is 216 miles long, and its area, including the adjacent islands, is estimated at 6,621 square miles. The geological formation of the island is mostly of eruptive rocks and crystalline limestone; in the east section mostly of crystalline chalk. It is traversed from east to west by a fine range of mountains, near the north coast, the highest of which is Nusaheli (9,612 ft.), while at least four other peaks in it exceed 6,000 ft. There is a large number of rivers, which generally run north; the chief are the Ruata, Bobot, and Saputana. But they are mostly unnavigable, and often dry in the dry season. In many parts the mountain chain extends to the

coast ; in others it gradually gives place to lowland, and in some places the sea is fringed by swamps. The only harbour is Amahai. The island is very little known, the only part with which Europeans are familiar being the western end, where the peninsula of Huammal is connected with the main island by a low narrow isthmus. Dense forests are everywhere, and provide excellent timber ; in all the swampy valleys sago palm grows wild.

Amboina and the Uliassers.—The island of Amboina or Ambon (from a Malay word meaning ‘mist’) lies to the south of the west part of Ceram, and east of it lie the group of small islands generally known as the Uliassers. It is the capital of the residency of its name, and at one time was very famous, when it enjoyed a monopoly in the cloves trade. It is 32 miles long, and has an area of 386 square miles ; its shape is very irregular, for it is divided into two unequal parts—Hitu and Leitimor—by a narrow alluvial isthmus. All these islands are of Tertiary (Miocene) formation, and are traversed by mountain ranges of fine-grained granite, in which serpentine with magnetite and other eruptive rocks are found. The shores of Amboina Bay are of chalk, and contain stalactite caves. The mountains are volcanic, though none is now active, but hot springs and solfataras are found and slight earthquakes are still experienced ; the highest mountains are Salhutu (4,020 ft.) and Wawani (3,609 ft.). The rivers are small and not navigable. In the Bay of Amboina are found 700 varieties of fish. Amboina is the most important port in the Dutch East Indies east of Makassar.

Of the other islands in the group, Haruku and Nusa Laut both contain hot springs. Saparua is almost divided into two by an isthmus, about half an hour’s walk across ; it is hilly, but along the coast is flat ground covered with coco-nut trees ; the principal products are cloves, but the sago grown is insufficient for the population. Melano is thickly wooded. Nusa Laut is hilly, but with plains in parts near the sea ; it has two good anchorages, available for both monsoons.

Banda Islands.—The Banda Islands lie 60 miles south of Ceram and 130 miles south-east of Amboina. They are ten in number, of which the three largest are Lontor or Great Banda, Gunong Api, and Banda Neira ; six of them together enclose the harbour of Banda. The whole area is about 20 square miles.

The longest, Lontor, is $7\frac{1}{2}$ miles long and crescent-shaped ; it is covered with ' parks ' of nutmeg, the Banda Islands having formerly been the exclusive nutmeg garden of the world ; the nutmeg trees grew under the shade of kanari trees, whose nuts produce an oil of value. The volcanic soil is good for their growth. On Banda Neira is the town of Banda, one of the cleanest, neatest settlements of the Dutch East Indies. Gunong Api (a common name of volcanoes in the Malay Seas) is an active volcano (1,858 ft.), with frequent prolonged periods of activity ; it is covered by bushes to within 700 ft. of the summit. No nutmegs grow on this island, but there are coco-nuts along the coast. Nutmegs grow on Run, Ai, and Rozen-gain, the last of which also has coco-nuts. On Run is a clean, white beach, frequented by turtles.

Ceram Laut and Goram Archipelago.—Ceram Laut is a cluster of islands on one coral reef about 20 miles long. Included with it are Gisser and Kilwaru to the west, and the Goram Islands, Suruaki, Goram, and Manavoka to the east-south-east. The bigger islands are of Tertiary (Miocene) formation, the rest are coral of recent formation. Most are covered with forests. There are no mountains in Ceram Laut of over 1,000 ft. Gisser is a coal dépôt, and Kilwaru a busy mart. The Goram Islands are higher, more populous, and more fertile than Ceram Laut. On Suruaki there are extensive swamps.

The chain is continued to the Kei Islands by the Matabela Islands, whose rugged hills are covered with coco-nut palms, and the very similar Tiru (or Towa), Nusa-Tello, and Tionfoloka Islands. Some of these latter are entirely waterless, owing to the pervious nature of the coral rock.

Kei (Ké or Ewaf) Islands.—This archipelago lies on the ridge mentioned above, that proceeds from Ceram, and continues to Timor Laut ; it is separated by deep water from the Banda Islands on the west, and the Aru Islands on the east. The whole archipelago has an area of 572 square miles. It consists of four groups proceeding from east to west : Great Kei (or Nuhu Yut) ; Nuhu Roa and Kei Dula ; the Tayando group ; and the Kur group. Of these the first consists of Tertiary rocks ; the others, post-Tertiary, principally of coralline limestone. Great Kei is a narrow and lofty island ; it is 64 miles in length, with a narrow tongue of land at its southern extremity. It is mountainous and wooded, with patches of cultivation on the

slopes ; the mountains, which rise to nearly 3,000 ft. in the north, traverse the centre of the island and slope down to either side. The coasts are usually high with steep cliffs. The other islands are comparatively low, but there are hills in the south and north-west of Kei Dula ; most are encircled by extensive shoals. The islands are all covered with dense forest, and produce excellent timber, some sorts of which are specially good for boat-building. Coco-nuts grow everywhere in abundance, and besides these are found areng palms, bananas, sago, maize, and vegetables. Trepan and tortoise are found in great numbers on the many reefs round the islands, and the neighbouring seas teem with fish, but the natives seldom go outside the reefs or fish in waters of greater depth than 10 fathoms. The settlements are round the coast.

Aru Islands.—This group, lying to the east of the Kei Islands, in the shallow sea between New Guinea and Australia, consists of one large island mass, Tanabesar, 122 miles long and 58 miles wide, and nearly 100 smaller isles. The area of the archipelago is 3,244 square miles. Tanabesar is intersected by several channels (*sungi*) of varying width, and less than 3 fathoms' depth ; it is regarded as making six separate islands. The whole group is for the most part of coralline limestone, and is of low elevation, and contains no rivers of note. The surface is mostly covered with virgin forest, largely composed of screw pines, palm trees, kanari, and tree ferns ; in Tarangan, the south portion of the big island, this is varied with grassy plains. The *sungi* are lined with mangroves. In many parts there are impassable swamps. The soil is fertile, but little cultivated. The principal settlement is Dobo on the small island of Wamar in the west, but the Aru islanders do not live in it, but merely visit it to bring their produce.

Timor Laut and Tenimber Group.—The Archæan ridge on which the Kei Islands stand, is continued to this group, consisting of 66 islands, most of which are known as Tenimber, though the two largest, Yamdena and Selaru, together with the islands between them in the Egeron Strait, are called Timor Laut. Most of these islands are of recent coralline formation, and their elevation is usually low. The only high parts are the island of Laibobar (over 1,500 ft.), probably a volcano, Molu, Vordata, Selu, and a part of the south coast of Yamdena. Earthquakes sometimes occur.

Yamdena has a much indented coast ; there is a low narrow foreshore with coco-nuts and mangroves, fringed in most places with precipitous cliffs of 60 to 80 ft. It is 74 miles' long and 26 miles wide in the middle. The west coast is lower than the east. The hills on the east coast are densely wooded.

Selaru is 30 miles long, and is mostly flat ; it is covered with high grass and less wooded.

On all the larger islands there are extensive swamps. The trees are of considerable height, but more sparse than on the islands previously described, and of not very great thickness. The islands are not fertile, but provide for the needs of the inhabitants. Maize is the staple food ; extensive coco-nut plantations line the shores ; a little rice and sago are cultivated, also bananas, papaws, mangoes, manioc, and sweet potatoes.

South-western Islands (Serwatti Islands).—This collective name is given to the two diverging chains of islands which continue the lines respectively of the Lesser Sunda Islands and Timor. The former, the northern chain, includes Serua, Nila, Damar, Roma and Wetar, and is continued northward from Serua through Manuk to the Banda Islands on the inner volcanic belt ; the latter, the southern chain, includes Kissa, Letti, Moa, Lakor, Sermata, and Babar, and is continued through the Timor Laut and Kei archipelagoes to the southern Moluccas on the Archæan ridge. The former are mostly volcanic, the latter mostly of Tertiary formation, while Lakor is of diluvial coralline formation.

Serua has an active volcano (2,294 ft.) ; the island is covered with coco-nut, kalapa, and mango trees. Nila has a lofty active volcano (3,908 ft.). The inhabitants grow coco-nuts and raise hops and poultry. They formerly cultivated cloves. Damar has an active volcano (3,110 ft.), and suffers from earthquakes. There is some low land on the west, but everywhere else the land rises steeply from the sea. Kolowati Bay penetrates 4 miles inland, with great depth of water. Otherwise the coasts are steep. The island is extraordinarily fertile. Near Wulur there are hot springs. Roma is 11 miles long and 6 miles wide. It is of volcanic origin, and contains hot springs ; its chief height is 1,905 ft. It is a very fertile island, especially in the south-east part. The staple product is maize, but aren palm and sago are also common. It receives the inhabitants of Kissa, who migrate here in periods of great drought from their own

island. Wetar (Wetta) is about 70 miles long and more than 20 miles broad. It is of sedimentary formation, with evidence of subsequent volcanic action. The land is broken and mountainous, especially on the north side, where precipitous cliffs reach the sea. The highest elevation is Tower Hill (4,390 ft.). There are many rivers and swamps, some of which are dry during the east monsoon. Most of the country is bare, but there are forests at certain places; on the south side there is grassland. There is an absence of plains. The chief anchorage is the open bay of Ilwaki on the south of the island.

Kissa is an unhealthy island about 7 miles long and 5 miles wide. It is of quaternary and triassic formations with traces of metamorphic gneiss and mica. It is mountainous and bare, without forest, and dry; sometimes a whole year goes by without rain. The coast is high and rocky, broken in places by narrow sand beaches. Letti (9 miles long, 5 miles wide) shares the conditions of Kissa: there is the same absence of forest and rain. A range of dome-shaped hills traverses the middle of the island from east to west, the highest point being 1,403 ft. Moa is 25 miles long, and is divided into two hilly parts by a strip of low marshy land thickly wooded with sago trees. It is a very fertile island, and receives the inhabitants of Letti when drought compels them to migrate. Sermata, 15 miles long, has a high range of hills (rising to 1,378 ft.) the sides of which slope steeply down to the sea. Babar, 18 miles long and having the same width at its widest part, though only 4 miles wide at the south end, is mountainous (rising to 2,953 ft.) and thickly forested; it contains several rivers. Its low coast is covered with woods. The island is fertile, but the other islands of the Babar group are bare and parched.

DUTCH NEW GUINEA

The Dutch territory in western New Guinea represents nearly one-half of the total area of the island. The northern shore faces the Pacific Ocean, the western and south-western the Ceram, Banda, and Arafura Seas. The eastern frontier is formed by the meridian of 141° E., excepting a portion of the frontier with the British Territory of Papua, which is made by the course of the Fly River between the two points where it is intersected by that meridian. Dutch New Guinea lies between the Equator and 10° S. lat.

The territory is practically undeveloped ; its coasts are imperfectly charted, and in the interior, proportionately to its vast extent, little detailed exploration has been carried out.

The broad mass of the main body of the island is extended westward in a comparatively narrow peninsula, demarcated on the north by Geelvink Bay. This peninsula is double, for about its middle it is deeply penetrated on the west by McCluer Gulf, the innermost part of which is known also as the Gulf of Buntuni. Between the head of this inlet and the western shore of Geelvink Bay the land is less than 10 miles wide, but to the north of this isthmus and McCluer Gulf is the broad sub-peninsula sometimes known as Arfak. Both parts of the peninsula are mountainous. There are traces in the Arfak Mountains of volcanic craters, and earthquakes are frequent and at times severe. The main range has a general elevation of 3,000 to 5,000 ft., but the highest point is 9,157 ft. In the southern section of the peninsula heights up to 6,000 ft. are known, but across its base, from the head of Geelvink Bay, there appears to be a marked depression along the Omba or Uba valley.

From the base of the peninsula, south-eastward of Geelvink Bay, a main chain of mountains trends north-west and south-east along the length of the island. In the Dutch territory it is known as the Charles Louis Mountains (5,000–9,000 ft.) to about 136° E. long., and then as the Nassau Mountains up to the course of the River Mimika and east of that as the Orange range. Until recently these ranges were known as the Snow Mountains. But the range makes practically one unbroken wall from Geelvink Bay through Dutch territory and beyond, the passes being of great height, from 6,000 to 9,000 ft. This chain stands towards the lowland to the south, and the block of Australia beyond, in a relation somewhat similar to that of the Himalayas towards India, if the shallow Arafura Sea and Torres Strait be regarded as parallels to the lower parts of the Indo-Gangetic plain, and Australia to the tableland of the Deccan. The greatest heights in this mountain range are Carstensz Peak in the Nassau Mountains (15,964 ft.), Wilhelmina Peak in the Orange Mountains (15,580 ft.) and Mt. Idenberg, near Carstensz Peak (15,379 ft.). All these and several others rise above the level of perpetual snow, which seems, in these parts, to be about 14,500 ft., though after clear nights snow is

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found everywhere down to 13,800 ft. Carstensz Peak at the east end of the Nassau range has large glaciers, and west of it, divided by a small rift from the triple-peaked Mt. Idenberg, is an extensive snowfield. Next, to the west, is Mt. Leonard Darwin, whose southern face has one of the most tremendous precipices known, with a fall of 10,000 ft. almost perpendicular and, despite the heavy rainfall, showing little sign of weathering. West of this mountain the height of the precipice diminishes till at $136^{\circ} 15'$ it is 4,000 ft.; at every few miles along the precipice there are great fissures. Many waterfalls descend along the eighty-mile limestone face of this precipice. No one had ever approached the foothills of this range till 1909.

Southward, between the main mountains and the sea, there are many ranges of knife-edged ridges and forest-clad mountains of rugged Alpine character, with steep interlocking spurs, broken into sections by the rivers that flow from the north. The foothills end abruptly and are succeeded by savannas. Then comes about 50 miles of forest-covered swamp. The ground is so low in all this belt that there is no point in it except one by the Kapare River, as much as 100 ft. high.

North of the great mountain chain the country has been even less explored than south of it, but there are parallel ranges of hills between it and the Pacific Ocean, such as the Van Rees Mountains (about 3,300 ft.) extending for about 75 miles, through which the Momberamo River cuts its way; the Gautier Mountains (7,875 ft.) near the sea to the south-west of Walckenaer Bay; and Mt. Cyclops (6,580 ft.), which may be volcanic, close to Humboldt Bay not far from the frontier.

The lowland is alluvial; great alluvial tracts spread not only in the south of the island, but along the course of the Momberamo and both north and south of the Van Rees Mountains. The soil is of extraordinary fertility, one result of which is that, without constant clearing, tracts that have been cut at once revert to forest growth. Much of the lowland is swamp, covered with mangroves, full of slime and stagnant water, and very unhealthy. The natural features make it a very difficult country for intercommunication; the barrier of the central range parts the north and south, while communication between east and west is hindered by the rapid rivers and the deep ravines through which they flow. The dense jungle, the savagery

of many of the natives, and the intense humidity all add to the difficulties of travelling.

The chief lakes discovered in the island are near the north coast; among them is Lake Rombebai, east of the Momberamo River, near the head of the deltaic region. It is 10 miles long and 5 miles wide, and is surrounded by swamp. Lake Senlani near Humboldt Bay, 10 miles long and 4 wide, has many villages about it. Another lake of some size is close to Triton Bay.

Rivers

Dutch New Guinea is full of large rivers, but in most cases their sources and, in many cases, a great deal of their courses are unknown. It has to be conjectured from the colour of the water whether a river is fed by the glaciers of the Central range or rises in the foothills or from the jungle. The great expeditions that have started during the last few years from the south coast have followed up many of the rivers, and large additions to geographical knowledge have been made by Lorentz, Rawling, Wollaston, and other explorers.

On the north coast the rivers as a rule are of no great length, but one, the Momberamo (Ambernoh or Rochussen), is of importance. Its basin has been estimated at about 23,300 square miles, and it drains the whole of the north side of New Guinea from Mt. Leonard Darwin in the west to Juliana Peak in the east, a distance of 250 miles in a direct line. It has many considerable confluent, of which the Rouffaer, flowing from the west-south-west, may claim to be the main stream, while the Idenberg, from the other side, is a big river and brings the waters of important tributaries. When the Momberamo passes through the Van Rees Mountains, there are many rapids in its course; after that it flows through marshes and a delta into the sea at Cape d'Urville. There is only one main mouth, but it is thought that a considerable amount of the water reaches the sea through the marshes along the coast. The river is navigable for nearly 70 miles from its mouth.

Along the western coast are several rivers that can be navigated for a short way from their mouths. In Arfak the chief are the Beraur, formed by the confluence of the Merarin and Giliwolo, and the Kabrara, the one river which is thought to

cut through the Arfak range. Several rivers including the Seljar and Ketero flow into the McCluer Gulf—the former has been navigated for 34 and the latter for 23 miles by vessels of 8 ft. draught.

Farther south is the Mimika, which was wrongly supposed to afford the best means of approach to the central range of mountains, and from this point onwards is a rapid succession of lengthy rivers with many tributaries, which flow some from the Snow Mountains and some from their foothills; many of these are linked together by interconnecting passages (*antassans*) so that a vessel with a draught of 6 ft. and a length of about 80 ft. went by river practically the whole way from the Eilanden to the Utaqua. None of these rivers is fordable till the mountains are reached, and all are replenished by constant rain. Their upper courses are full of rapids and waterfalls; when they reach the plain their beds change from stone to mud. Their course constantly changes owing to dams of timber falling across them. The mouths of some are difficult to find in mangrove swamp.

Of these rivers the most important are the Utaqua, with its tributary the Setakua, the West and East Kasteel, the Blumen, the Pater le Coq d'Armandville, the North-West, the Lorentz (or North), the Utumbuwe, and the Eilanden. The Utaqua has been ascended by a sea-going ship for 17 miles, beyond that for two days by a launch, and for another day by a canoe. The Kasteel, which bifurcates above its mouth, has been ascended for some way, the upper part of the West Kasteel, called the Tyenara, contains many islands. The North-West River could be navigated with rising water for 8 hours by a vessel of 12 ft. draught: it is connected with another river, the Helling, by a big, navigable channel. The Lorentz (or North) is a river of great length, and has been ascended by a similar vessel to about 5° S. lat., by a smaller steamboat to 4° 47' S. lat., and by a canoe to 4° 40' S. The Utumbuwe has been ascended by a vessel of 12 ft. draught for 55 miles, and by a steamboat 28 miles further. The Eilanden is a river of very variable width; it takes its name from the many islands in its course.

The rivers farther south are less important, but the Odammon has many big tributaries, one of which, the Mapij, has been ascended for a considerable way. Beyond it the Digul is the

most considerable river on the south coast of Dutch New Guinea. Its basin is about 7,700 square miles ; it is about 6 miles wide at its mouth, and it has been ascended for nearly 400 miles by a steamer of 6 ft. draught. Its lower course is through flat, swampy land, above that it flows through low hills. Its principal tributary is the Uwimmerah, a river with innumerable windings, flowing for the most part between steep hills.

The remaining rivers along this coast include the Bijau, Merauke, and Beusbach, the last being at its mouth the boundary of British territory. For a small part of its course the Fly, the longest river in New Guinea, forms the boundary of Dutch and British territory. The volume of water in this river is immense, and it can be navigated by vessels of some size for 500 miles, and above that for another 100 miles by small craft.

Many of the rivers cause considerable inundations ; among those which flood the surrounding country may be mentioned especially the Mimika and Momberamo.

Coast

The coasts of Dutch New Guinea are much indented, especially in the western part. There are a large number of natural harbours, and where there is a deficiency of them the presence of islands off the coast affords good anchorage. Unfortunately, several of the places that have the best natural facilities have proved very unhealthy and not suited for the residence of Europeans ; so that little can be done to develop such places as Manokwari and Dorei.

The nature of the coast varies considerably in different parts. Along the north coast, starting from Cape Sorong, it is generally high as far as the Cape of Good Hope, though with low places near the shore. After that the Arfak Mountains come near the sea, but to the east of Little Geelvink Bay there is a strip of lowland by the coast. The great indentation made by Geelvink Bay is about 230 miles wide and 170 deep, and has a natural barrier formed by the Schouten Islands across the greater part of its entrance. The west shore is high, steep, and mountainous ; the east is low, flat, and alluvial, and these last characteristics extend to Cape d'Urville, the promontory at the head of the delta of the Momberamo. East of this projection as far as Sarmi Point the coast continues low, with mountains visible inland, but after that, as far as Humboldt Bay, it

is as a rule high, rocky, and rugged, and much broken into bays and creeks, though some parts are low and swampy, with thick forests of mangroves. Tanah Mera Bay in this sector of the coast has a rocky shore with mountains rising steeply from the sea ; the beaches are sandy and there are no swamps. The southern shore of Humboldt Bay, which lies between Mt. Cyclops and the Bougainville range, is low and planted with coco-nut palms.

Along the west and south-west shore of the island the shores are as a whole lower. The southern shore of McCluer Gulf, however, is high, and that is the characteristic of most of the shore of the peninsula to the south as far as Nautilus Strait, which separates Adi Island from the coast. The rugged coast between Capes Kokrauf and Sapei is fringed with a coral reef, except in front of the mouths of rivers. From Nautilus Strait to Kamrau Bay the coast is flat and covered with vegetation, but from there to the eastern side of Etna Bay it is mountainous. After Mt. Buru (4,564 ft.), near Lakahia Bay, the Charles Louis Mountains turn inland, and then begins the great alluvial tract of the lower course of the rivers that rise in the Central range ; the shore is low, densely wooded, and monotonous ; the only gaps are the mouths of the rivers, none of which has any distinctive character.

Among the harbours on the north coast is Little Geelvink Bay, about 28 miles west of Cape Mamori ; it affords shelter from easterly winds, with a depth of 20 fathoms. Farther east is Dorei harbour, the westernmost bight within Cape Mamori, about a mile long and half a mile broad, and with a depth of 20 fathoms. Manokwari, the chief settlement of the Assistant Residency, is here, but the site is unhealthy during the rainy season. Farther up Geelvink Bay is Wandammon Bay, to the west of the peninsula of its name, about 28 miles in a north-and-south direction with apparently deep water close in shore, but with alluvial flats round the south end of the bay. East of Geelvink Bay are Walckenaer Bay, Tanah Mera Bay, and Humboldt Bay. The first is too open to make a good harbour, but the abundance of coco-nut trees in the neighbourhood has created a trade in copra which might be developed ; the second has a length of about a mile, a breadth of half a mile, and a depth of 35 to 40 fathoms in the centre of the bay, but reefs and rocks make it somewhat dangerous ; the third, which is

5 miles wide and about 3 miles deep, furnishes good protection in two deep inlets.

On the west and south-west coast the harbours are more numerous and penetrate farther into the land. McCluer inlet or gulf extends to within 10 miles of the north coast ; it is over a hundred miles long, and more than 20 wide at its mouth, though it narrows to 10 miles at the entrance to the farther part of it, called Bentuni Gulf, about 40 miles east of the open sea. The northern shores are largely constituted of islands which form the deltas of the rivers that flow into it. The settlement of Fakfak is not on a harbour, but an anchorage is afforded by the screen created for it by Panying Island, and the sea is deep up to the coast. From here to Cape Sapei the coast forms a wide bight, in which are lesser bays fronted by islands. Kamrau Bay lies on the east side of the Onin peninsula ; from the head of it Arguni Bay is entered, and extends about 35 miles inland with numerous islets. Triton Bay (or Uru Languru Bay) lies farther east, and extends inland 10 miles ; like Dorei harbour it has proved unhealthy. Etna Bay is the interior part of Lakahia Bay, which trends 12 miles to the north-east, to which Etna Bay adds a further 19 miles to the east. On its north side are mountains, alternating with mangrove swamps ; the south side has mountains, but they are in detached groups. Kaimana, on the bay of that name, is the commercial centre of the region ; it is on a safe harbour, being protected by a strip of land and a small island in front ; ships can anchor close to the shore.

Geology

The geology has been very little investigated. The core of the central mountain chain is Archaean, revealed and cut up by denudation ; the basal exposures consist of granite, gneiss, diorite, dolerite, and associated igneous rocks. During the folding movement which raised the chain there were frequent dislocations and extrusion of igneous rocks, with volcanic activity. Of this last, both past and present, there is evidence in several parts of the island, but mostly outside Dutch territory, where the rocks appear to be in the main Archaean and sedimentary. The age of the metamorphic rocks is mostly undetermined, but many are certainly Tertiary ; such rocks are common in the mountainous districts, and have in some

parts been proved metalliferous. In the stratified rocks Jurassic fossils have been identified in deposits similar to those known in the Moluccas and Ceram, but, again, Tertiary deposits appear to be more frequent and widely distributed. There are lead-coloured brecciated limestones with interbedded dolerites in association with Kainozoic rocks. The precipice already mentioned, which marks a vast fault in the region of Mt. Leonard Darwin, consists of a very dark and hard limestone. Upper Kainozoic rocks are represented by upraised coral reefs and similar deposits known elsewhere as *karang*, all round the coasts and occurring inland to an altitude of 2,000 ft.

ISLANDS ADJACENT TO NEW GUINEA

The shores of New Guinea are fringed by many islands, great and small. At the north-west extremity there are a large number, of which the most important are Waigiu, Batanta, Salwatti, and Misol. These are sometimes called the Papua Islands.

Waigiu, separated from New Guinea by Dampier Strait, which is about 30 miles wide, is nearly 80 miles long with a greatest width of 28 miles. It is much cut up by deep inlets which penetrate from the south coast almost to the north. It is rugged and hilly, but has no high mountains, the highest peaks being 3,642 and 3,081 ft. In the north are hard crystal-line rocks: the south is mostly of coralline limestone. The island is covered with dense forest. On the north coast Offak harbour is good. To the south-west the island of Gemien is separated from Waigiu by the river-like Kabu Strait. The island produces a red variety of bird of paradise which is unique. Off the south coast are the Great and Small Saonak Islands, which yield many coco-nuts.

Batanta, to the south of Dampier Strait and divided from Salwatti by Pitt Strait, is 40 miles long with a width of 4 to 8 miles. It is densely wooded and mountainous, its greatest height being 3,676 ft. It is almost uninhabited: there are two villages on the north coast, and a few settlements of Salwatti people on the south.

Salwatti, south of Batanta, is separated from New Guinea by the narrow Galewo Straits. It is a round island, about 30 miles across; the coasts are regular and have no very deep

indentations. The north coast is backed by limestone hills about 1,000 ft. high. The east of the island is low and swampy, with extensive forests of sago and, on the beach, coco-nut palms. There are some brooks, but no rivers of note.

Misol is divided from New Guinea by a shallow sea, though very deep waters part it from Ceram, from which it is 50 miles north. The island is 50 miles long and 23 broad. It tapers towards the west and widens to the north-east and south-east. The north portion of the island and adjacent islets are flat, the southern portion and adjacent islets hilly, but no point rises over 1,800 ft. The coast is generally rocky. East of Liliuta, on the south-east coast, the ground is swampy and covered with mangroves. The south-east promontory is almost detached from the island by an isthmus about a quarter of a mile wide. There are three rivers on the north coast which may be entered by boats at high water and are navigable for 3 or 4 miles. The island is visited for cutting *gofasa*, a wood used for boat-building. The inhabitants of Liliuta collect trepang and shells.

Between Waigiu and Halmaheira is Saiang, $3\frac{1}{2}$ miles long, and from $1\frac{1}{2}$ to 3 miles broad—a low flat island frequented by turtle. North of Waigiu are the Aiu (or Yowl) Islands, an archipelago of about 20 small islands in an area of 30 miles by 15. Baba ($2\frac{1}{2}$ miles long) and some of the others are inhabited, the natives trading with Waigiu. The islands are wooded with coco-nut trees. Beyond the Equator to the north-east are the Mapia (St. David or Freewill) Islands which were awarded to Holland as against Spain; they are coral islands covered with coco-nut palms. Pegun, the chief island, is the residence of a king.

The entrance to Great Geelvink Bay is blocked by several islands. The northernmost are the Schouten Islands or Misore group. These include Suk (or Supiori) to the west, Biak (or Wiak) to the east. The former is 17 miles long and reaches a height of 1,600 ft.; the coasts are for the most part uninhabited. The latter is about 45 miles long and 23 wide. Mt. Sobunem, at the north end, is about 800 ft. high; otherwise, the island is only about 50 ft. above the sea. There are three rivers. In the south-east part are swamps, where sago palms thrive.

Farther within the bay the most important island is Jobi (or Jappen), which is 110 miles long and from 10 to 15 miles wide.

A ridge of mountains about 2,500 ft. high runs along the centre. The south coast is indented by deep creeks and fronted by a number of wooded islets and reefs; it affords numerous anchorages, and on it is the chief settlement, Ausus, which trades with Dorei. The north coast is high, steep, and thickly wooded, and affords only temporary anchorage.

Off the west coast islands are numerous. Karas Kuni (or Gudin) lies south of Cape Patimuni. It is 8 miles long, and reaches a height of 1,200 ft.; there is a hill at each end of it. There are two villages on the island, and six more on two neighbouring islets. Divided from New Guinea by the Nautilus Strait is Adi, an island of coral formation, 32 miles long and very low. The north side contains several villages, and is more populous than the south. Vogel Island is a small, low island to the south of it, on which turtle are found. Near the east end of the Dutch possessions in New Guinea is Prince Frederick Henry Island, divided from the shore by the narrow and tortuous Princess Marianne Strait. It has an area of about 2,820 square miles; its extreme length is over 100 miles and its extreme breadth over 50. It is low, perfectly flat, marshy, and covered with dense forest. It is of little or no value.

LESSER SUNDA ISLANDS

The Lesser Sunda Islands form, as stated in Chapter I, a chain between the South-Western Islands and Java. This chain, in the eastern part, has also a loop to the south through Timor, Rotti, Savu, and Sumba Islands. The principal islands will be dealt with from east to west.

Timor.—This island, which extends south-westward from Letti in the South-Western group, is the largest of the Lesser Sundas, but, as already seen, only the western part belongs to Netherlands India. The island differs considerably in its physical characteristics from the rest of the Lesser Sundas. It is traversed by a series of parallel mountain-chains, whose outliers, especially on the north coast, descend in many places to the sea, while in other parts, chiefly in the south, there are low plains, sometimes of considerable extent. Towards the centre of the island, so far as it is known, the mountain system is confused; Belu (Dutch Central Timor) consists of mingled hill and plain country. The mountains are steep and of irregu-

lar outline, and the upper parts are frequently bare and rugged. No volcanoes are known, but there are numerous mud geysers. The rivers have generally short courses and steep slopes ; none of them are navigable except in a few instances for native boats at the mouths. Only a few, chiefly in the south, have running water all the year ; in most cases the broad stony beds have at best only isolated pools in the dry season, though in the wet season they carry rapid torrents. There is often forest along the banks. The north and west coasts are deeply indented and generally steep-to ; the south is flat in the eastern part and backed by lagoons and mangrove swamps, but steep and rocky in the western, with no noteworthy indentations except that of Normini Bay. The principal inlet is Kupang Bay on the west coast, 12–15 miles long, containing small islands. There are coral reefs in many places along the coasts. Apart from ports of call for Dutch steamers, Kupang and Atapupu, there are a good many places on the west and north coasts where anchorage may be found at certain seasons. Kupang itself is dangerous for shipping in the north-west monsoon. The seas on the south of Timor are frequently very violent during the south-east monsoon, and on the north-west occasionally during the monsoon from that quarter.

Rotti, &c.—Off the south-western extremity of Timor are Semaun and the larger island of Rotti, which is hilly in the centre but has extensive plains in some parts towards the coast, and many inlets, of which Buka Bay or Cyrus Harbour in the south-east is the largest and safest. There are numerous streams which are useful to agriculture. To the west is the unimportant island of Savu, which sometimes gives its name to the sea enclosed by the chain and loop of the eastern Lesser Sundas, also called Timor Sea.

Alor and Islands westward to Flores.—Alor (or Ombai) is divided from Timor to the south-east by Ombai Passage, 17 miles broad. It consists largely of old volcanic mountains, with coralline limestones : the volcanic form is only observable in the highest parts, near the east coast. Deep and often steep ravines make the highlands difficult to traverse. Tanggapuri, the only plateau on the island, lies west of the peak. The coast is mostly rocky and little indented ; only here and there are small coastal plains. There is one deep inlet, Kebola Bay, on the west coast, 10 miles long and under a mile wide, which

divides off the north-west part of the island from the rest, to which it is joined by an alluvial isthmus only about 30 ft. high, and $2\frac{1}{2}$ miles wide. To the west are the islands of Pantar, lofty and rugged, and Lomblen, which is flat in the centre but has mountains in the north and south, of which Mt. Lobetola is a constantly smoking volcano, over 5,400 ft. in elevation. Adunara, west of Lomblen, has an isolated volcanic cone, Ili Boleng (5,446 ft.), in the south-east: north of it lies the plateau of Hinga (about 650 ft.) surrounded by hills, of which those on the west reach extreme heights of about 3,000 ft. Solor Island, south of Adunara, though smaller than Adunara and Lomblen, gives its name to the group which includes them.

Flores is the largest member of the Lesser Sundas excepting Timor, having an area of about 8,870 square miles. The east coast, facing Flores Strait, has two deep inlets, Okka and Konga bays, the first cutting through high mountains, while the second has a marginal plain intersected by small rivers. The north coast rises steeply, and has a succession of mountain-ridges and few plains, the most extensive being that round Maumere Bay, and that of Lapeh. After Maumere Bay the principal inlets on this coast are Todo Bay, with Chindeh Island, and the deeply cut Hading or Celebes Bay. In Maumere Bay the chief island is Great Bastard or Pulu Besar. Paloweh or Rusa Raja, a single peak 2,860 ft. high, also rises off the north coast. The west coast, which rises steeply or is of terrace formation, has Bajo Bay to the north and Parapat Bay with Sendal Island to the south-west, and is fronted along its southern half by Rinja Island across Molo Strait. The south coast is steep and little indented from the south-eastern point to the peninsula east of Endeh Gulf, and a succession of peaks lie close to the coast. The west part of the south coast about Aimere Bay is flatter, the slopes easier, and the cliffs form a broken wall some 60 ft. high, with white sand at the foot, but they are steeper where the Munti Mountains and Pocho Ndeli approach the sea. The most important bay on the south coast is Endeh Gulf. It resembles Maumere and Hading bays in form. Boats visiting Barai and Endeh in the east of the bay are protected from the west wind by Endeh Island in the centre.

The heavily wooded interior is by no means fully known, but the existence of slates, chalk, and sandstones, eruptive rocks, volcanoes, and the general trend of the mountains east and west

indicate a structure similar to that of the other islands of the chain. In the east of the island (east of a line from Sikka to Maumere) the massifs are more or less isolated: the highest points are Mt. Egon (5,587 ft.), Mt. Lobetobi (5,590 ft.), and Mt. Ilimandiri (4,928 ft.). Between Maumere and Ende are such heights as Mt. Aomasi (5,289 ft.) and Mt. Bara (5,679 ft.), but on the isthmus north of Ende Gulf the mountains are much lower. Manggarai, Ngado, and neighbouring western districts are mostly highland: the mountains, which form a connected complex, reach 7,050 ft. in Mt. Amburombo, 7,366 ft. in Mt. Inerië (or Rokka), and 7,815 ft. in Mt. Pocho Lika. The island is narrow, and the streams, flowing generally northward and southward, are consequently torrential from source to mouth. In northern Manggarai, where there is an extensive area of limestone, they sometimes run underground. Only the Reo River is navigable for boats for about a mile.

Sumba, also called Sandalwood, the western island of the loop to the south of Flores, is separated from it by Sumba Strait. Except in the south, where the cliffs rise steep and high from the sea, the coasts are mostly flat. Here and there the surface is hilly and rocky, and it is mountainous farther inland, but never reaches any great height. The chief named mountains are the Ana-Kala Mountains in the west, the Mandas Mountains in the centre, and the Massu Mountains in the east, which reach a height of 2,200 to 3,000 ft. There are no volcanoes. The subsoil is mostly limestone and clay, usually covered with a layer of fertile black soil. The numerous capes form bays, which afford good anchorage, particularly in the north, the most important being Waingapu (or Nangamesi) Bay. Along the coast are sandbanks, and stretches of grass which is burnt each year. The rivers, which are usually fordable and unnavigable, are of importance for agriculture, especially in west Sumba. One of the most important is the Memboro, on the north coast, rising in the Ana-Kala Mountains, and reaching the sea at the village of Memboro; access to its mouth is rendered difficult by a sand-bank. There is also the Kambara, formed of several small rivers which rise in the Mandas and Massu Mountains, and reaches the sea at Kabaniru; it is navigable even for large vessels for a considerable distance inland.

Sumbawa.—West of Rinja, the narrow Linta Strait separates

the minor island of Komodo, which is separated by Sapeh Strait to the west, from the more important island of Sumbawa, itself divided from Lombok, again to the west, by Alas Strait. Sumbawa is very irregular in shape : the largest inlet is Saleh (or Sumbawa) Bay which cuts deep into the north-west part of the island in a south-easterly direction. Moyo Island at its mouth reduces the entrance to two narrow but deep straits, of which the most northerly, Batahai Strait, is most used ; the other is called Saleh Strait. The north shore of the bay is very steep and regular ; the south flat, much cut up and scattered with small islands. To the west between Tanjong Labubua (Perapat Point) and Tanjong Menangis is Sumbawa Bay, on which the capital, Sumbawa, is situated. For trade, Bima Bay, running into the north of the island at about $118^{\circ}40' E.$, is the most important. It is divided into an outer and an inner bay ; the latter, where deep, is only about 300 yds. wide, becoming gradually wider and shallower. The landing-place at Bima, on the east side of the bay, is shallow and bad, and the entrance to the bay is difficult owing to mud-banks, particularly in the east monsoon. This bay, which is surrounded by hills, is considered one of the safest in the archipelago. To the south, Chempi Bay is only separated from Sumbawa Bay by a narrow isthmus, so that the whole island is divided with an eastern and a western peninsula. Except off the south coast, Sumbawa is surrounded by a large number of small islands. Moyo Island is mountainous and covered with thick wood ; it is uninhabited. In the northern entrance to Sapeh Strait is Sangeang Island or Gunong Api, an active volcano 6,180 ft. high. Komodo or Rattan Island is composed of volcanic mountains, and is uninhabited.

Sumbawa is very mountainous, and has no plains of any size, but only a few stretches of alluvial land on the coasts. The mountains are largely volcanic, but partly of limestone. In the most northerly part, between Sumbawa Bay and Sanggar Bay, is the twin-peaked Mt. Tamboro (9,042 ft.), the highest in the island, which had a disastrous eruption in 1815. The other volcanoes appear to be extinct or quiescent, though earthquakes are frequent. There are no important rivers : the streams are mostly unnavigable, or only navigable for small boats at the mouth. In the rainy season they are in flood, and they dry entirely during the east monsoon.

To the north of Sumbawa, at distances from 30 to 100 miles, are the Paternoster or Tenga, and the Postillon or Sabalana Islands, but they have no relation to the Lesser Sunda chain, being separated from it by deep sea. They consist of numerous small low banks, surrounded by reefs, and are not well known.

Lombok lies west of Sumbawa, across Alas Strait. The coasts, which are surrounded by a number of small, uninhabited islands, are less difficult for shipping than those of Bali, and there are many good anchorages, particularly on the west and east, the best being Ampenan, in Lombok Strait, which is suitable for the largest vessels, though the heavy surf makes landing difficult and dangerous, especially in the west monsoon. The more southerly bay of Labuan-Tring is then safer, but the entrance to the harbour is here narrow and obstructed by a reef, and trade is little developed. Other good anchorages are Sugean on the north coast and Blongas on the south; Piju Bay on the east coast is said to be completely protected from the weather and to afford safe harbour for the largest vessels, but the more northerly bays of Labuan Haji and Lombok have not this advantage, and the former is not completely safe even in the east monsoon.

Lombok is divided for nearly its whole length by two mountain chains, separated by a valley which slopes gradually upwards in terrace formation, and is broken in the centre by a ridge of hills (Gunong Sesan) 100 ft. high. The southern chain, which runs from the south-west point of the island to Tanjong Ringgit in the south-east, does not rise above 1,000 ft. The northern chain, which is a volcanic massif of about the same height and breadth, begins with Gunong Wangsit, $11\frac{1}{2}$ miles north of Ampenan, and forms a connected chain as far as Gunong Punikan, whence it rises to Renjani, or Lombok Peak (11,800 ft.), one of the highest volcanoes of the archipelago. The mountain is flanked by lower peaks, united by a plateau (about 7,200 ft.) containing a lake, Danu or Segara Anak. There are many small rivers, which are not navigable, but never run dry and are useful for irrigation, particularly in the north. On the south coast the closeness of the mountains to the sea prevents a river system of any size. The mountains are covered to a considerable height with woods, but show little sign of cultivation, which is only carried on in the lower ground.

Bali is separated from Lombok by Lombok Strait, and from

Java, to the west, by Bali Strait. Its coast is mostly steep and little indented, and there are few good anchorages. Buleleng roadstead, on the north, is often so unsafe in the west monsoon that vessels cannot load or unload, and there is a heavy surf on the south coast in the south-east monsoon. Pantei Timor Bay, on the east side of the southern peninsula, the Tafelhuk, which is protected by an island, has a safe anchorage in all winds at Benoa, but the entrance between the coral reefs is too narrow and tortuous for large ships. With the exception of a few small areas along the coast and a large plain in the south, the whole island is mountainous and cut up by deep ravines in the lower parts. The chief range, running from Lombok Strait to Bali Strait, is divided into three parts : (1) The eastern mountains include the highest in the island, Mt. Agung or Bali Peak (10,499 ft.), a volcanic mountain regular in form, with a steep bare summit. Mt. Batur, in this section, appears to be the only active volcano in the island. (2) The hills of the central division are of recent volcanic formation. The two crater-lakes of Pengilingan are believed to have been united in one large body of water before 1818, when the water burst its banks and devastated an area in central Buleleng which is still not entirely reclaimed. (3) The Jembrana Mountains fill the narrow western division ; they are uninhabited and barren, and have never been described. The southern peninsula, the Tafelhuk, is a small chalk plateau. The channels of the streams (which are unimportant) are often blocked, especially in the north and east, with lava, rocks, and sand, and the floods during the west monsoon often break through the high banks and cause destruction. From May to November the streams are mostly dry.

CHAPTER III

CLIMATE

General conditions—Pressure—Winds—Temperature—Humidity—Rainfall—Mist and fog—Cloud—Sunshine—Thunderstorms—Wind storms—Tables.

GENERAL CONDITIONS

EQUATORIAL conditions are modified in the climate of Netherlands India by the proximity of the continents of Asia and Australia. The south-east and north-east trade winds are combined with, or opposed to, the monsoonal winds from the adjacent continents. The rainy seasons found elsewhere in these latitudes are not found here. The archipelago occupies generally a region of comparatively low atmospheric pressure. Southern Asia is a centre of high pressure and northern Australia of low pressure during the southern summer. The conditions are reversed during the southern winter. Hence over nearly the whole region, north-west winds prevail from December to March, and south-east winds from April to October. The months of January and August are those when the respective monsoons are steadiest; April and November, as a rule, are the months of changeable winds. The west is the wet or 'bad' monsoon, bringing generally the greater part of the rainfall; during the east monsoon rain is still plentiful, except in the south-east of the archipelago, but the diminution at this time is sufficient to justify a distinction between 'dry' and 'wet' seasons. In the Moluccas the east monsoon brings, in certain localities, the heavier rain. The whole region is one of abundant, and, in parts, of excessive rainfall, those islands or parts of islands which face the north-west winds receiving the greater amount. The rainfall is not, in general, of the same type in both monsoons: during the west monsoon rain is more nearly continuous than during the east, when, however, it is somewhat more intense. Temperature maintains a high level, and while the diurnal range is fairly large the difference between any two months is extremely small. South Sumatra, Borneo, and the

eastern islands have the highest temperature, and the yearly range is greater in the east than in the west. Humidity is great, and fogs are common in the inland and mountainous districts. Many local influences bear upon the climate of different places; the nature of the ground—high or low, bare or wooded, smooth or rugged—affects radiation and insolation, and therefore temperature and humidity; the relief of the land deflects normal wind-currents and influences the local rainfall; opposite sides of the same islands reflect the dry or moist character of the winds they face. Thus many of the observations, especially of rainfall, have only a local significance. Remarkable changes in climate as affecting health conditions are experienced, with but a small rise in altitude and distance from the coast. The archipelago lies between regions of cyclonic disturbance, and wind storms are for the most part absent. Electric storms, on the other hand, are very frequent, especially in the afternoons. These are on the whole beneficial, seldom doing material damage, but often cooling the air in a marked degree.

Observations.—Batavia is in the first rank of the meteorological stations whether for observations of rainfall or other factors. Rainfall stations alone are abundant in Java, and fairly well distributed in the other islands. Many have been in working order for over thirty years. The case is otherwise with stations making observations of other meteorological factors. Before 1911 only sporadic records of this kind had been made. For temperature, humidity, and wind, therefore, only very short-period results are available. This is not here so serious a defect, however, as it would be in a district which showed much variation in these factors. Temperature and humidity are both for any one place remarkably equable year by year, and the prevailing winds are also fairly free from variation.

PRESSURE

In January pressure is highest in the north-west, lowest in the south-east; in July this position is reversed. Gradients are nowhere steep, though the general average is steeper in the time of the southern summer than in the winter. A characteristic of these latitudes is the small range of barometric pressure and the regularity of the diurnal variations. At Batavia pressure is highest in September, lowest in April, but

the difference between the means for these two months is only 0.042 in. The greatest mean daily range is 0.111 in. During thirty-five years the difference between the absolute highest and lowest readings of the barometer at Batavia is 0.47 in.

WINDS

General Distribution.—The general régime of the winds over the area which includes Netherlands India may be roughly illustrated as follows :

<i>Mid-March to Mid-September.</i>	<i>Mid-September to Mid-March.</i>
South-west monsoon	North-east trade wind
Equator	Equator
South-east trade wind	North-west monsoon

The three wind stations, numbered 35, 42, and 56 in Table II, are situated at fairly convenient spots to serve as an index to the winds of the southern part of the archipelago. One station, Discovery Oostbank, stands in the west, the other two in the east. The table on p. 88 affords a more general view over the whole area.

All these winds are subject to local variations. All the coasts are under the influence of land and sea winds, the former extending to 15 miles from the shore in Java. The monsoons at their height may cause these local winds to become unnoticeable ; according to direction of the line of coast, they may receive additional strength by merging, especially, with sea winds ; when the monsoons are weaker a deflected direction of the two winds in combination may result. For example, Batavia has chiefly north and north-east winds during the south-east monsoon. Inland, mountain peaks and chains have another disturbing effect upon the direction and force. Most of the straits between the high islands exhibit some local modifications, the prevailing winds being influenced by the direction of the channels. In Sunda Strait, the north-west monsoon blows from south-west to west-north-west. On the south coast of Java at the same season, south-westerly currents prevail ; only in January and February are west and west-north-west winds felt. Southward of the Eastern islands, south-west to north-west winds blow during the same monsoon, but these are generally feeble and uncertain. On either side of

WINDS IN NETHERLANDS INDIA

Zone.	April.	May to Sept.	Oct.	Nov.	Dec. to Mar.
1. 10°-2° N.	N. and NE. (from NE. trade) intermittent with SE. and S. In the North China Sea mostly NE.; in the South China Sea, S.E.	At first unsteady with frequent S. winds. In June change to SW. monsoon (Asiatic low pressure).	Unsteadiness, due to weakening of the SW. monsoon.	Monsoon changes to NE. trade.	N. or NE. (from NE. trade) joined to Australian monsoon.
2. 2° N.-2° S.	Varying S., S.E., and NE. winds. Period of the turn of the monsoon. Calms frequent.	In May S. and SE. winds appear. In June and following months these predominate. The SE. winds pass north of the Equator, and merge into SW. monsoon.	S. or SE. The SE. trade recedes to the S.	Varying NE., NW. or other winds. Period of the turn of the monsoon.	NW. winds predominate, blowing towards the Australian low pressure area. Join the NE. trade in northern latitudes.
3. 2°-10° S.	In the south of this zone SE. trade winds prevail. In the north the monsoon is changing, & winds are variable.	SE. winds very steady.	SE. still predominant, but change begins.	In the south of this zone SE. trade still holds. In the north W. or uncertain winds. Beginning of NW. monsoon at the end of the month.	NW. or W. winds from Australia northward. Become weak in March.
4. 10°-15° S.	SE. trade begins to blow west of Australia.	SE. winds very steady.	SE. still predominant,	S. winds showing traces of SE. trade still. Period of the change to the monsoon.	W. or SW. winds blowing toward the Australian depression prevail west of Australia.

Borneo and Celebes, north-east, north, and north-west winds merge into the western monsoon of the Java Sea. In the Molucca passage the northerly monsoon veers to north-east in December. It is at its greatest strength in February and March, but is still northerly in April. In June the south-westerly monsoon takes the form of a south wind with or without a slight westerly element. In the Molucca Sea, where the monsoons, especially the eastern, blow steadily, winds blow from north-north-west and south-south-east. In the Banda Sea the south-east winds are strong by May, decreasing during September, and appearing again along with the remnants of the west, in March.

Winds of Sumatra.—In the north of Sumatra the wind directions are outside the scheme of winds which holds for the greater part of the Dutch Indies. North-east winds in January alternate with the south-west monsoon in July. In the Malacca Strait land and sea breezes are regular on both coasts, and in the offing the monsoons are only regular when in the adjacent seas they are at their height. The south-west monsoon seldom blows far up into the strait. In the middle of the strait at this season (May to October) variable winds prevail, chiefly south-east and south-west, with long calms. On the Sumatra side light winds and calms prevail, and heavy squalls from the land are experienced during the night. ‘Sumatras’—squalls from the south-west—are more common during the south-west monsoon than in the north-east monsoon. They generally blow during the first part of the night, are sometimes sudden and severe, and are accompanied by thunder, lightning, and rain. North-west squalls are also more common during the south-west monsoon and occur in the north-western part of the strait. The north-east monsoon season (November to April) is here the fair season, there are seldom at this time any hard squalls and there is much less rain than in the other season. In November variable winds, frequently north-west and west, occur, but occasionally the north-east wind sets in in this month. North-west and west winds are not unknown during the period of the north-east monsoon. Late in March the north-east and northerly winds become variable and light, with strong land breezes at night.

On the east coast of Sumatra regular land and sea breezes may be felt in favourable spots as much as 30 miles inland.

The wind is generally north-east by day and south-west by night all the year round. But at any time north-west and south-west winds are observed at uncertain periods, with fine weather. 'Sumatras' are more frequent on the east than on the north coast. On the west coast of Sumatra the influence of the south-west and north-east monsoons is felt as far south as about lat. 2° N. But from the north-west point of Sumatra, to 4° N. lat. the winds are quite different from those between lat. 4° N. and 2° N. In the more northerly of these divisions; the south-west monsoon prevails from May to October and the north-east monsoon from December to March. At night, during the height of the former, the sea breeze at times prevails, and generally the land winds are clearly perceptible by the deflection of the wind to south-east or north during the night.

Between lat. 4° N. and 2° N. is the region of calms and light variable winds. The influence of the monsoons is felt in a westerly tendency of the day winds from March to November, and in an easterly tendency during the other monsoon. February has south-east, east, and west winds by day, south-west, east-south-east, or south-east by night. In March west winds by day and north-east to east by night are observed. April is marked by south-west and north-west winds day and night. From May the north-west winds become more prominent, reaching their maximum in October. From May to November at night the winds are north-west to north-east. In August north-east winds are more frequent. From November to January the day winds are variable, north-east to east generally at night. The winds at Seribu Dolok in Central North Sumatra are illustrated in Table II, p. 104. Here the directions at different hours show an irregular distribution. Seribu Dolok is 50 miles from the north-west coast of Sumatra, so that land and sea winds are not to be looked for. The least frequent winds are south-east, south, and north.

At Padang north-west and west winds prevail from February to March with fair weather; in May, June, and July north-west to south-west winds are experienced, with thunder and rain squalls. The south-east monsoon, when at its height in the Indian Ocean, is noticeable in Padang, but only as a light breeze prevailing for a couple of hours. From August to December the north-west and west winds are well established

with hard squalls and much rain. January is mostly calm, with a land wind at night.

Winds at Batavia.—For Batavia observations extending over a period of ten years are averaged in the following table in order to illustrate the constancy of the land winds and the influence of the monsoons. The hour of observation is 7.30 a.m., when the land winds are still blowing.

	N.	NE.	E.	SE.	S.	SW.	W.	NW.
	%	%	%	%	%	%	%	%
Jan. . .	3.6	.9	3.5	3.5	20.7	13.8	43.8	10.2
Feb. . .	5.0	.5	2.6	1.5	27.1	13.9	35.6	12.8
Mar. . .	1.3	—	3.8	4.6	35.8	23.6	24.1	5.5
April . .	1.3	—	11.0	8.3	51.9	12.7	10.4	1.3
May . .	.4	—	15.8	10.5	53.7	9.6	7.4	1.3
June . .	.4	—	16.5	11.5	57.3	7.9	4.0	.4
July . .	.4	.4	21.5	17.0	46.0	8.3	3.8	—
Aug. . .	.4	1.2	16.5	11.5	59.3	5.5	4.0	.4
Sept. . .	.8	—	12.9	10.9	58.9	12.9	2.4	—
Oct. . .	1.9	.8	8.3	9.8	57.8	13.9	5.7	1.5
Nov. . .	1.7	—	7.6	8.4	46.9	21.9	9.7	1.3
Dec. . .	1.7	.4	5.7	3.5	27.0	17.1	35.4	8.3

Calms are frequent at Batavia, being 38 per cent. of the total in February and never less than 24.5 per cent. (in August). The force of all winds is light. Frequency and force as a rule increase together.

Diurnal Variation.—Wind directions show considerable changes at different times of the day and night in accordance with local and monsoonal influences. Ten-year records taken at Batavia show that from 10 a.m. to noon north-west winds prevail from December to March, north in October and November, and east from April to September. From 1 to 6 p.m. the winds are north or north-west from January to April, north-east to north from May to November, and west in December. At Kayumas in East Java, on the north spur of the Kending Mountains (lat. 7° 56' S., long. 114° 9' E., alt. 3,117 ft.), south winds blow throughout the year at 6 a.m., with south-west in January and south-east in November and December. At noon, from November to March north winds prevail, and east and north-east the rest of the year. At 5 p.m. the prevailing direction is east, though in March only a westerly wind appears frequently. The north-west monsoon, therefore, is chiefly in evidence here when blowing in conjunction with the sea wind. Similar conditions are observed at Tosari, the health station in the Tengger Mountains. At 6.30 a.m. throughout the year

the prevailing direction is south-east, varied with south-west in January and December. At 1 p.m. the winds are north-west, with north-east from October to December, and at 5 p.m. the north-west wind appears in December to February, but south-west the rest of the year. In January to March the early morning south-east wind is occasionally strong, though no wind here is very strong. Even when in January and February a strong west or west-north-west wind is blowing at the surface in the plains, the clouds on high mountains are seen to be passing to the west or west-north-west. The upper regions from 6,000 to 7,000 ft. or higher enjoy a uniformly serene climate throughout the year.

Winds at Higher Altitudes.—Wind conditions in the higher altitudes have been to some extent investigated in Java. The north-west monsoon extends to about 6,000 ft., so that above this altitude a south-east wind blows throughout the year. The extent to which the south-east wind is driven out by the north-west monsoon depends on altitude, and accordingly the highest elevations receive less rain than those up to about 3,000 ft. During the south-east monsoon the upper current is checked in force at night.

At Jember in East Java (lat. $8^{\circ} 9' S.$, long. $113^{\circ} 44' E.$, alt. 277 ft.), 20 miles from the south coast, the prevailing winds at 7 a.m. are north and north-east from November to April with south the rest of the year; at 1 p.m. south and south-west all the year, and at 6 p.m. the same as at 1 p.m. with frequent north and north-east from December to March. Yet at Krampon on the south coast of Madura (lat. $7^{\circ} 10' S.$, long. $113^{\circ} 10' E.$) north-westerly winds prevail from January to March at all hours of observation. For the rest of the year south is the most frequent direction at 6 a.m., south-east and south at 2 and 6 p.m.

TEMPERATURE

The most marked characteristic of the temperature is the very small monthly range and the comparatively low daily range. The fact that the sun's rays are never far from vertical ensures a high average of temperature (78° – $80^{\circ} F.$); the great length of coast and high proportion of cloud do much to temper the heat and maintain an equable climate. For its equatorial position the archipelago therefore is not so hot as might be

supposed, for in every part either a refreshing sea breeze or else considerable altitude is to be found. A fairly efficient cooling agency is in addition the frequent thunderstorms which may cause the thermometer to fall from 5° to 7° F. in twice as many minutes.

Some mean temperatures are given in Table III, p. 106. In many cases two yearly maxima, about May and October, are discernible, and one minimum, about January.

In Sumatra, April and May are usually the warmest months, the end of the year being the cooler time. At Banjarmasin maxima appear in May and October. The first maximum at least is delayed after the sun's zenithal position, owing to terrestrial radiation and the cooling of the earth by the rains. It may be noted that Sumatra and Borneo have a somewhat higher temperature than Java. At Batavia and elsewhere in West Java the double maximum is better marked, the minimum falling in January and February. In the higher altitudes the second maximum appears earlier in September, though at Tosari the whole of the western monsoon season is warmer than the eastern monsoon, no doubt due to the greater amount of cloud in the former season. At Assempagus in the extreme east of Java, and on the north coast, maxima appear in April and November. At Menado in Celebes May and October show increases in temperature, while in Ceram and Timor the monsoons, rather than the sun's position directly, seem to have the greater effect.

The daily range is of course greater in the mountains than at the coast, and in the eastern Lesser Sunda Islands is greater compared with similar altitudes in the west. At Batavia the mean daily range is 11.8° F., but it may reach to 38° in the mountains. The absolute maximum at Batavia is 96.1° . At Assempagus 99° has been recorded and in Timor 104° is said to be frequently reached. At Batavia the absolute minimum is 66° (in August); elsewhere the lowest figure that can be found is 36.7° at Pangerango. It is probable, however, that at the highest altitudes in bare regions the freezing point is reached—one authority indeed mentioning a minimum of 27° F.—though where trees abound it is said that this is never the case. During thirty-five years the absolute maximum at Batavia reached 90° or over, once each in March, June, and July, twice in February, three times in April, four times in

January, five times in May, seven times in December, ten times in August, twenty-one times in September and November, and twenty-four times in October. The absolute minimum during the same period fell to between 70° and 66° , once in November, twice in January and February, three times in October, seven times in June, twice that number of times in September, eighteen times in July, and twenty-five times in August. The mean monthly maximum at Batavia is 91.6° , the mean daily maximum 84.6° ; the mean monthly minimum is 68.7° , the mean daily minimum 73.8° , and the greatest daily range 24.3° . Except in so far as altitude affects the temperature (about 1° F. for every 280 ft.) the figures for Batavia form a criterion of the temperature of South Sumatra, South Borneo, and Celebes. A few others appear in the following table :

	<i>Absolute maximum.</i>	<i>Absolute minimum.</i>	<i>Mean maximum.</i>	<i>Mean minimum.</i>	<i>Maximum daily range.</i>	<i>Mean daily range.</i>	<i>Mean temperature.</i>
	$^{\circ}$ F.	$^{\circ}$ F.	$^{\circ}$ F.	$^{\circ}$ F.	$^{\circ}$ F.	$^{\circ}$ F.	$^{\circ}$ F.
Java :							
Buitenzorg . . .	91.3	65.1	85.8	71.2	22.3	14.6	76.8
Tosari . . .	71.2	49.5	65.7	57.4	16.6	8.3	60.6
Assembagus . .	99.1	62.4	89.6	70.7	31.0	19.1	79.3
Sumatra :							
Padang	93.0	69.8	86.7	73.4	18.7	13.3	79.7
Billiton :							
Tanjong Pandang .	91.6	66.6	85.1	72.0	22.7	13.1	77.0
Borneo :							
Pontianak . . .	92.7	68.4	87.4	73.6	22.9	13.9	78.8
Celebes :							
Menado	94.5	66.0	86.0	72.1	24.7	13.9	78.4
Moluccas							
Amboina	93.2	66.6	84.6	73.4	19.8	11.2	79.3

The course of the temperature during the day at Batavia is probably typical of other low-lying places. Sunrise at about 6 a.m. marks the lowest figure reached. Temperature then rises in increasing ratio each hour ($.7^{\circ}$, 2.0° , 2.8°) to 9 a.m., from which hour the rise is maintained, but at a decreasing ratio, to 1 p.m. It then falls by a constantly increasing ratio each hour ($.2^{\circ}$, $.5^{\circ}$, $.8^{\circ}$, 1.1° , 1.4°) to 6 p.m., after which there is a fairly even and gradual fall through the night to 6 a.m. The check to the rate of increase after 9 a.m., as well as the more gradual decrease to shortly after sunset, may be referred to the clouds which usually begin to gather at the former hour.

HUMIDITY

High relative humidity is characteristic of the climate on the sea coasts and other low-lying parts. Most places record from 78 to 84 per cent. In the highlands a greater range is experienced, and in the highest mountains (11,000 ft.) as great a range as 87 per cent. has been recorded in 24 hours. Local differences in humidity are considerable, much depending on the direction and character of the wind and the situation of the place of observation. An indication of the diurnal variations is available only from Batavia. The greatest daily range is in August (30·8 per cent.), the least in February (18·6 per cent.). At different hours the variations from the mean, though differing considerably in different months, maintain a similar relation to the hours of the day. Thus 6 a.m. is the hour of greatest relative humidity in February and August (the dampest and driest months practically) and for the year, noon is on the average the driest hour, though in February this falls at 2 p.m.

RAINFALL

Seasonal Distribution.—In general the greatest amount of rain is registered during the west monsoon season, for at this time the periods of duration of the rains are longer than in the east monsoon. On the other hand, individual showers at the latter season are often more intense than in the former. The wettest months are accordingly December, January, and February, the driest July to September. In certain places each change of the monsoons, or one of them, is accompanied by increased rainfall. This is especially noticeable on the south coast of West Java, as at Chilachap (Station 15 in the tables below). In North Sumatra other conditions obtain, and here October is the wettest, while February and March are the driest months. Bulungan, north of the Equator in Borneo, shows no important variation from the general rule. In the north-eastern peninsula of Celebes these conditions are partly reflected, for a second maximum of rainfall appears between two seasons of greater dryness, in March or April, and in July to October. In the Moluccas and northern New Guinea June and July are the wettest months, October and November the driest.

Regional Distribution.—On the average the greatest amount of rain falls in the south part of West Java, where the average

is 126 in. annually. West Sumatra follows as the next wettest region (122 in.). Borneo generally has a rainfall very similar in amount to the last. Least rain falls in the Lesser Sunda Islands, which receive on an average only 58 in. annually.

In Java a region of heaviest rainfall lies on or very near to a straight line drawn from Mount Cherimaj in Cheribon to Banyuwangi on the east coast of the island. This line passes through or near the highest mountain peaks. In addition, the whole of the south-western parts of Bantam and Batavia with an irregular tract stretching through nearly the whole length of the southern part of Preanger, have an annual rainfall of 120 to 150 in. The driest part of Java is the north coast, and especially the north coasts of the western districts of Pasuruan and Besuki. Exceptional, however, is the extreme north of Semarang, where Mount Muria catches the north-western monsoon.

The following table illustrates both the regional and seasonal distribution of rainfall with the number of rain days. Amounts of rainfall are in inches and the number of rain days are in italics and brackets. The division of seasons is not very suitable for North Sumatra, Borneo as a whole, or Celebes as a whole, but is maintained in these cases for the sake of uniformity.

	W. monsoon <i>Dec.-Mar.</i>	'Change' <i>April-May.</i>	E. monsoon <i>June-Sept.</i>	'Change' <i>Oct.-Nov.</i>	Totals.
West Java : north part	52.09 (70.7)	16.14 (24.0)	18.07 (28.4)	17.48 (24.9)	103.78 (148.0)
„ „ south part	53.89 (78.1)	20.67 (30.6)	23.74 (35.7)	27.17 (34.8)	125.47 (179.2)
Mid Java : north part	50.99 (72.1)	13.90 (22.6)	11.27 (20.3)	12.40 (21.3)	88.56 (136.3)
„ „ south part	58.59 (76.9)	17.13 (25.8)	15.70 (25.5)	22.36 (28.2)	113.78 (156.4)
East Java : north part	44.72 (63.2)	11.03 (17.9)	6.30 (11.1)	7.32 (12.0)	69.37 (104.2)
„ „ south part	52.76 (72.6)	14.93 (22.4)	16.45 (25.6)	17.48 (22.8)	101.62 (143.4)
Sumatra : West . .	45.79 (66.3)	20.31 (31.0)	30.63 (49.8)	25.59 (37.3)	122.32 (184.8)
„ East . .	43.54 (62.8)	18.63 (28.7)	24.18 (40.5)	19.92 (30.5)	106.27 (162.5)
„ North . .	28.66 (43.1)	15.12 (22.8)	30.04 (46.7)	21.89 (31.8)	95.71 (144.4)
Borneo	47.56 (64.9)	21.46 (29.1)	28.32 (41.4)	22.99 (32.0)	120.33 (167.4)
Celebes	39.01 (57.3)	17.60 (27.9)	20.24 (35.5)	10.55 (18.1)	87.40 (138.8)
Moluccas & North New Guinea	34.37 (57.9)	20.90 (31.3)	38.54 (54.7)	12.09 (22.1)	105.90 (166.0)
Lesser Sunda Islands .	35.62 (53.2)	8.22 (14.6)	6.57 (12.8)	7.64 (12.0)	58.05 (92.6)

Table IV, p. 107, gives for selected stations the mean monthly and annual rainfall, and the mean annual number of rain days.

Quantitative Distribution.—The following table shows the percentage of observatory stations the annual rainfall at which comes within the limits in the left-hand column.

<i>Annual Rainfall.</i>	<i>Java.</i>	<i>Sumatra.</i>	<i>Borneo.</i>	<i>Celebes.</i>	<i>Moluccas & New Guinea.</i>	<i>Lesser Sunda Islands.</i>
	%	%	%	%	%	%
Under 39 in. . .	—	—	—	2	—	18
39 to 59 „ . .	8	3	—	14	—	53
60 to 79 „ . .	26	6	3.5	22	18.75	11
80 to 119 „ . .	32	54	43	50	56.25	18
120 to 159 „ . .	26	29	50	10	18.75	—
160 to 177 „ . .	6	4	—	2	6.25	—
177 in. and over .	2	4	3.5	—	—	—

The wettest station in the whole archipelago is Kranggan in Banyumas, Java (Station 16, Table IV) with an average annual precipitation of 327 in. From October to December, the three wettest months, 116.29 in. are recorded in 69.2 days or 1.68 in. per rain day. The heaviest fall in 24 hours at this station is 4.61 in. in October, an amount which has been considerably exceeded elsewhere. At Besokor in Semarang at an altitude of 150 ft., 20.12 in. has fallen in 24 hours (January to February). The driest station in Java is Assembagus (Station 2) with 35 in. annually in 68 days, or $\frac{1}{2}$ in. per rain day. In the whole archipelago the driest place is Palu in Celebes (Station 44) where 21 in. annually fall in 77 days, or .27 in. per rain day. The greatest amount of rain in any one year has fallen at Sirah Kuchong in Kediri (Station 8). Here in 1909 398.11 in. were precipitated. Seasons and years vary considerably in amount of rainfall.

The greater part of the rain at Batavia falls in showers of very short duration. The number of showers on the average each month ranges from thirty-six in January, lasting in the aggregate 60.9 hours, to five in August lasting 6 hours. The mean duration of the showers is about $1\frac{1}{2}$ hour. But 42 per cent. of the showers in the 'dry' season and 40 per cent. in the 'wet' last less than 5 minutes each. Of the total number of showers 74.89 per cent. fall in the wet season and 25.11 per cent. in the dry.

Very heavy showers, which are classed as 'cloudbursts', are those during which 1 mm. (0.04 in.) or more falls in 1 minute, the minimum duration of the shower being 5 minutes. This

is equivalent to a minimum of 1 in. of rain in 25 minutes or $2\frac{2}{5}$ in. per hour of rain. At Batavia 184 such showers were recorded in 22 years, 60 in the dry and 124 in the wet season. They may occur at any hour of the day or night, but the afternoon is the time of greatest frequency.

Daily Distribution.—The dissimilarity between days in either monsoon is not on the average very clearly marked. But when the west monsoon blows more than usually definitely in Java rain may fall for 24 hours uninterruptedly and everything inside a house becomes damp and mildewed. During the east monsoon little or no wind beyond the uniform change of land and sea winds may be felt, and heavy mists hang over the plains and hills during the night. As the sun's heat increases during the day these mists rise and reappear as cumulus cloud and the sea wind begins to be felt. The sky gradually becomes overcast and the clouds darker. About 3 or 4 p.m. lightning is seen and rain falls, or, even if no rain falls, thunder is generally heard inland. If it rains the sky quickly clears again towards evening. These are types of days in either monsoon. On the whole, the day is slightly more wet than the night, the driest part of the day is 6 a.m. to 11 a.m., when 12·5 per cent. of the rain falls, and the wettest from noon to 7 p.m., when 41·8 per cent. falls.

Drought.—A study of periods without rain has been made for 70 stations in Java only. In East Java the longest period of drought, 147 days, is at Jatinangor in the Preanger Residency, at an altitude of 2,493 ft. ; August is the middle month of this dry period. In East Java a drought lasting 227 days in July (the middle month) is on record at Situbondo. Of the mean yearly maxima figures are from 12 to 53 days in West Java, and from 14 to 116 days in East Java. The last quoted mean maximum is recorded at Besuki (alt. 16 ft.). For Batavia the monthly maximum periods of drought observed for 35 years are as follows, those months marked with a number of days greater than the month's duration being the middle months of the period of drought—

<i>Month.</i>	<i>Days.</i>	<i>Month.</i>	<i>Days.</i>
Jan.	10	July	72
Feb.	12	Aug.	72
Mar.	10	Sept.	89
Apr.	19	Oct.	[31]
May	30	Nov.	16
June	33	Dec.	10

October is marked with the number of days in the month in brackets to indicate that in some year it was rainless, but the middle of the period of that particular drought fell in another month.

The following table gives the monthly percentage of the yearly total of days of drought at Batavia, and at the stations in Java with the smallest and largest mean yearly totals :

	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>	<i>Mean total.</i>
	%	%	%	%	%	%	%	%	%	%	%	%	
Batavia	1.5	1.1	2.8	4.5	11.1	10.5	16.5	19.3	14.5	11.4	4.7	2.0	123
Buitenzorg	1.5	0.7	0.0	2.5	6.9	16.1	21.6	23.9	14.7	7.4	1.8	2.8	42
Besuki	3.1	2.2	5.6	8.3	9.5	9.6	11.4	17.3	12.3	12.4	8.3	4.3	240

The minimum number of days in a period of drought is 6, and the smallest amount of rain which is noticed is 0.02 in. A day with less rain than that figure is a 'rainless day'.

MIST AND FOG

Allusion has been made to the mist which gathers especially in July and August in the lowlands of Java, during the evening and night. Though information is lacking, it is not difficult to conjecture that in these latitudes mist is general in the 'dry' season in favourable spots elsewhere. Some observations of fog drift have been made for one year at Tosari. The hours of observation are 6.30 a.m., 9 a.m., noon, 1 p.m., 4 p.m., and 5 p.m. Taking these hours in the reverse order, at 4 and 5 p.m. fog was observed every day except 1 day in July; at 1 p.m. 2 days in July alone were free from fog; at noon 1 day in May and August, and 5 days in July were the only exceptions to fog. At 9 a.m. and 6.30 p.m. fog was less frequent, the number of days on which fog was observed being as follows :

	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>
6 a.m. . .	11*	8	8	1	2	0	3	5	22	19	26	28
9 a.m. . .	15*	18	23	11	10	6	6	13	25	26	30	31
Total (2 hrs.)	26	26	31	12	12	6	9	18	47	45	56	59

* Observations begin on January 10.

It thus appears that in this mountain district most fog occurs in the north-west monsoon, while in the plains it is most frequent in the other season. In fact, while from the south-west and south-east together fog was observed on 411 occasions, from north-west and north-east it drifted up on 1,185 occasions in the year. At 6 a.m. in accordance with the prevailing winds

the south-east produced most fogs; at 9 a.m. and at 4 p.m. north-east; at noon, 1, and 5 p.m. the north-west was the quarter from which far the greatest number of fogs were seen.

CLOUD

Cloud is plentiful during the daytime especially, and at Batavia the mean amount is 5.9 (0-10 scale). Monthly means are as follows :

<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>
7.5	7.4	6.6	5.9	5.0	5.2	4.7	4.3	4.6	5.5	6.5	7.2

If the rainfall figures are compared with these it will be seen that February and December have much the same amount of cloud, but in the former month the rainfall is $12\frac{1}{2}$ in., and in the latter only $7\frac{1}{2}$ in. July and September agree both in cloud and rainfall, but while August has almost as much cloud as July, the former has less than half the rainfall of the latter. Compared with some other stations the rainfall at Batavia for January and February is not excessive, yet the average of cloud is very considerable. The hours of the day show a variation in the amount of cloud which can be readily expressed in figures. The hour of least cloud is 4 a.m. At 5 a.m. there is a little more; at 6 a.m. considerably more, the figure rising to 0.1 above the mean. From 7 to 9 a.m. there is a decreasing amount; from 10 a.m. to noon cloud increases to 0.5 above the mean, and falls gradually till 3 p.m. At 4 p.m. it increases to 6 p.m. when it reaches the maximum of 0.9 above the mean, after which it falls evenly through the night to the minimum at 4 a.m. There are thus two maxima in the 24 hours, at 6 a.m. and 6 p.m., though the first is much smaller than the second, and two minima, at 4 a.m. and 3 p.m., though the second is much less marked than the first.

SUNSHINE

Observations extending over a period of 12 years at Batavia show that January has the least amount of sunshine, August the most. The monthly and annual means may be compared (though the periods of observation differ widely) with those at a mountain station, Pengajaran (3 years) in East Java (lat. $7^{\circ} 46' S.$, long. $112^{\circ} 23' E.$, alt. 7,780 ft.).

SUNSHINE AT BATAVIA AND AT PENGAJARAN

Monthly and Annual Means. Percentage of possible duration.

	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>	<i>Year.</i>
	%	%	%	%	%	%	%	%	%	%	%	%	%
Batavia	36.0	40.5	50.5	59.8	66.6	62.2	65.5	71.2	70.5	61.3	49.5	39.5	51.6
Pengajaran	19.7	23.5	25.9	34.1	27.7	28.4	31.1	30.5	27.9	25.1	25.9	25.2	27.1

At both stations the middle of the west monsoon season has least sunshine.

THUNDERSTORMS

Thunderstorms with or without lightning are a feature of the climate as has already been remarked. At Batavia 122 thunderstorms on the average occur yearly. During the west monsoon in January and February especially night thunderstorms (midnight to 6 a.m.) are more frequent than at other times of the year. The east monsoon brings about half the total occurrences between 12 noon and 6 p.m. But it is at the 'changes' of the monsoons that afternoon storms are most frequent. The figures are as follows, in percentages of total occurrences :

THUNDERSTORMS. FOR THE YEAR

Percentage of total occurrences at different hours

Batavia. 34 years

<i>Hours.</i>											<i>Per cent.</i>
Midnight to 6 a.m.	.	.	.	.	.	.	.	.	.	.	18.1
6 a.m. to noon	.	.	.	.	.	.	.	.	.	.	5.3
Noon to 6 p.m.	.	.	.	.	.	.	.	.	.	.	50.4
6 p.m. to midnight	.	.	.	.	.	.	.	.	.	.	26.2

The monthly distribution through the hours of the day is as follows :

<i>Hour.</i>	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May.</i>	<i>June.</i>	<i>July.</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>
	%	%	%	%	%	%	%	%	%	%	%	%
Midnight-6 a.m.	28.2	23.8	19.9	15.0	14.9	19.9	18.9	24.1	13.0	13.4	12.0	14.1
6 a.m.-noon	6.9	8.2	6.0	3.8	2.9	2.5	2.5	2.7	3.3	4.4	7.1	7.1
Noon-6 p.m.	33.2	33.6	49.3	55.5	53.9	45.6	42.6	49.8	51.8	61.8	61.7	55.5
6 p.m.-midnight	31.7	29.3	24.9	25.5	28.2	23.0	36.1	23.5	31.8	20.4	19.2	23.3

WIND STORMS

Neither the typhoons of the North China Sea nor the cyclones of the Cocos Islands are reported near the coasts in the archipelago. Off the islands on the west coast of Sumatra two cyclones occurred in 1871, but the first, in November, was 100 miles and the second, in July, was thrice that distance from the islands. In the Cocos Islands cyclones are fairly frequent,

the years, for example, 1861, 1863, 1876, 1894, 1902, and 1909 are so noted. The belt of calms over the Dutch archipelago may extend at certain seasons to 3° north of the Equator.

TABLES

I. List of Selected Stations.

II. Wind Directions as Percentages of Total Observations.

III. Mean Monthly and Annual Temperature.

IV. Mean Monthly and Annual Rainfall; Mean Annual Number of Rain Days.

In Tables II—IV, as in the preceding chapter, figures in heavy type are maxima, and those in italics minima, of a series.

TABLE I

LIST OF SELECTED STATIONS

The following list gives the approximate positions of stations referred to in the following tables. For convenience of reference, the stations are given the same numbers in each table. Where no altitude is given, the station is within a few feet of sea-level.

No.	Island and Name of Station.	Alt. Feet.	Lat. ° ' "	Long. E ° ' "	
	JAVA, EAST :				
1	Banyuwangi	16	8 13 S.	114 23	On Bali Strait.
2	Assembagus	132	7 45 S.	114 13	On coastal plain 11 m. NW. of Baluran (4,100 ft.).
3	Kudus	56	6 48 S.	110 50	On coastal plain 13 m. S. of Muria (5,260 ft.).
4	Pugar	10	8 23 S.	113 31	In Jember plain, W. of coastal hills.
5	Patgitan	23	8 12 S.	111 5	In Kali Patgitan valley, surrounded by hills.
6	Kalisat	3,609	8 1 S.	114 9	On slope of Ijen Mts.
7	Tosari	5,840	7 54 S.	112 55	On NW. slope of Tengger.
8	Sirah Kuchong	3,413	7 57 S.	112 27	7 m. WSW. of Butak (9,426 ft.).
9	Kediri	203	7 49 S.	112 0	On inland plain between Wilis and Kelut Mts.
10	Surakarta	341	7 34 S.	110 50	On plain of Solo.
	JAVA, WEST :				
11	Cheribon	10	6 43 S.	108 34	—
12	Edam	—	5 58 S.	106 51	Island in Batavia Bay 11 m. from coast.
13	Batavia	23	6 11 S.	106 50	—
14	Kebumen	69	7 40 S.	109 40	South coast plain, 8 m. inland.
15	Chilachap	20	7 44 S.	109 1	West coast of Chilachap Bay.
16	Kranggan	1,020	7 21 S.	109 6	3½ m. SSW. of Sembung (5,390 ft.).
17	Bandung	2,346	6 55 S.	107 36	In central portion of western plateau.
18	Buitenzorg	890	6 36 S.	106 48	—
19	Chipetir	1,870	6 52 S.	106 41	12 m. from Wijnkoops Bay.
20	Menes	361	6 23 S.	105 57	6 m. from W. coast (Sunda Strait).

TABLE I (continued)

No.	Island and Name of Station.	Alt. Feet.	Lat. °	Long. E. °	
SUMATRA, W. COAST :					
21	Pulo Tello . . .	14	0 3 S.	98 17	Batu Islands.
22	Singkel . . .	33	2 17 N.	97 45	—
23	Kuta Raja . . .	—	5 33 N.	95 19	5 m. from NW. point of Sumatra.
SUMATRA, INLAND :					
24	Lahat . . .	328	3 47 S.	103 32	In the Palembang highlands.
25	Palembang . . .	—	3 0 S.	104 46	On the Musi, 45 m. from the coast.
26	Lubu Sikaping . . .	961	0 8 N.	100 9	In the Padang highlands.
27	Balige . . .	2,992	2 20 N.	99 3	S. shore of Lake Toba.
28	Toba . . .	3,772	2 30 N.	99 0	—
29	Seribu Dolok * . . .	4,659	2 56 N.	98 35	N. of Lake Toba.
SUMATRA, E. COAST :					
30	Bengkalis . . .	—	1 28 N.	102 7	Malacca Strait, south.
31	Lho Seumawe . . .	—	5 14 N.	97 8	Malacca Strait, north.
32	Bintang I. : Tanjong Pinang . . .	—	0 56 N.	104 27	—
33	Banka I. : Muntok . . .	—	2 4 S.	105 10	—
34	Billiton I. : Tanjong Pandan . . .	—	2 45 S.	107 39	W. coast of island.
35	Discovery Oostbank * . . .	92	3 35 S.	109 10	SE. of Billiton, in Java Sea.
BORNEO :					
36	Pontianak . . .	10	0 1 S.	109 20	12 m. from W. coast.
37	Banjermasin . . .	—	3 19 S.	114 37	12 m. from S. coast.
38	Bulungan . . .	22	2 51 N.	117 22	21 m. from E. coast.
39	Samarinda . . .	9	0 28 S.	117 7	23 m. from E coast.
40	Putus Sibau . . .	164	0 50 N.	113 0	On the Upper Kapuas River.
41	Amuntai . . .	65	2 25 S.	115 18	74 m. from E. coast, W. of hills.
42	Den Bril . . .	92	6 5 S.	118 54	Off SE. point of Celebes.
CELEBES :					
43	Makassar . . .	7	5 8 S.	119 24	W. coast.
44	Palu . . .	—	0 56 S.	119 52	W. coast.
45	Menado . . .	13	1 30 N.	124 50	NE. peninsula.
46	Tomohon . . .	2,625	1 20 N.	124 48	In highlands of Minahasa.
47	Gorontalo . . .	—	0 30 N.	123 3	On Gulf of Tomini.
48	Sangi I. : Taruna . . .	19	3 42 N.	125 30	—
MOLUCCAS :					
49	Ternate . . .	—	0 47 N.	127 23	—
50	Ceram : Amahai . . .	—	3 20 S.	129 0	S. coast of island.
51	Amboina . . .	—	3 42 S.	128 10	S. coast of island.
NEW GUINEA :					
52	Windesi . . .	263	2 25 S.	134 15	W. of Geelvink Bay.
53	Merauke . . .	13	8 28 S.	140 23	S.W. coast.
54	Aru Is. : Dobo . . .	16	5 46 S.	134 20	—
55	Kei Is. : Tual . . .	65	5 34 S.	132 45	—
56	Maety Mirang * . . .	85	8 22 S.	128 30	E. of Timor, in Timor Sea.
LESSER SUNDA IS. :					
57	Timor : Kupang . . .	49	10 10 S.	123 34	Near SW. point of island.
58	Flores : Larantuka . . .	2,199	8 18 S.	122 59	E. point of island.
59	Sumba : Waingapu . . .	—	9 38 S.	120 17	NE. coast of island.
60	Sumbawa : Bima . . .	—	8 27 S.	118 43	N. coast of island.
61	Lombok : Selong . . .	480	8 40 S.	116 33	E. part of island.
62	Bali : Singaraja . . .	656	8 6 S.	115 5	Above N. coast of island
63	„ Negara . . .	—	8 20 S.	114 39	SW. coast of island.

* Stations for wind observations only.

TABLE II

WIND DIRECTIONS AS PERCENTAGES OF TOTAL
OBSERVATIONS

		<i>January.</i>								
<i>No.</i>	<i>Station.</i>	N.	NE.	E.	SE.	S.	SW.	W.	NW.	
29	Seribu Dolok . . .	5.8	41.5	18.3	6.4	2.3	5.8	7.7	12.2	
35	Discovery Oostbank	3.5	—	—	—	0.5	8.1	23.3	64.6	
42	Den Bril	4.6	—	—	—	—	3.0	37.0	55.4	
56	Maety Miarang . .	1.2	1.2	0.6	—	1.7	9.3	25.8	60.2	
		<i>February.</i>								
29	Seribu Dolok . . .	9.9	39.2	15.0	4.3	6.0	6.3	3.9	15.4	
35	Discovery Oostbank	5.5	—	—	0.5	3.5	6.5	25.5	58.5	
42	Den Bril	12.9	—	—	—	—	4.3	29.3	53.5	
56	Maety Miarang . .	5.2	4.7	1.8	4.6	1.2	11.6	14.0	56.9	
		<i>March.</i>								
29	Seribu Dolok . . .	6.7	31.6	14.1	5.3	6.3	7.4	5.7	2.9	
35	Discovery Oostbank	15.1	1.0	—	1.0	3.2	—	52.7	27.0	
42	Den Bril	12.2	2.4	6.5	5.6	3.2	4.8	21.9	43.4	
56	Maety Miarang . .	5.4	1.1	3.8	7.0	3.8	4.2	18.2	56.5	
		<i>April.</i>								
29	Seribu Dolok . . .	7.0	27.8	15.8	5.5	5.0	9.9	11.8	17.2	
35	Discovery Oostbank	3.6	8.0	12.6	32.5	18.5	3.6	8.0	13.2	
42	Den Bril	1.4	2.4	47.0	35.4	5.3	0.5	2.4	5.6	
56	Maety Miarang . .	3.0	3.0	18.9	55.4	13.1	8.0	1.2	—	
		<i>May.</i>								
29	Seribu Dolok . . .	4.8	17.6	9.4	4.8	6.5	13.7	20.1	23.1	
35	Discovery Oostbank	1.8	2.2	20.0	62.0	6.4	4.3	2.7	0.6	
42	Den Bril	—	—	40.5	56.0	3.5	—	—	—	
56	Maety Miarang . .	—	—	28.5	60.1	9.9	1.5	—	—	
		<i>June.</i>								
29	Seribu Dolok . . .	5.1	8.8	2.9	1.5	8.6	23.5	22.6	27.0	
35	Discovery Oostbank	1.7	7.2	17.3	68.5	1.7	2.4	0.6	0.6	
42	Den Bril	—	—	46.6	50.8	2.6	—	—	—	
56	Maety Miarang . .	—	—	11.3	72.0	16.7	—	—	—	
		<i>July.</i>								
29	Seribu Dolok . . .	2.6	5.8	3.4	1.8	4.6	19.4	35.5	26.9	
35	Discovery Oostbank	0.4	1.8	9.2	79.7	5.9	2.2	0.4	0.4	
42	Den Bril	0.6	1.2	40.4	53.6	4.2	—	—	—	
56	Maety Miarang . .	—	—	22.4	65.4	12.2	—	—	—	

TABLE II (*continued*)

No.	Station.	<i>August.</i>							
		N.	NE.	E.	SE.	S.	SW.	W.	NW.
29	Seribu Dolok . . .	3.9	7.6	4.4	1.7	8.3	23.2	23.5	27.4
35	Discovery Oostbank	—	—	10.3	89.2	0.4	—	—	—
42	Den Bril	—	—	67.0	31.3	1.7	—	—	—
56	Maety Miarang . .	—	—	25.0	66.8	7.6	0.6	—	—
<i>September.</i>									
29	Seribu Dolok . . .	5.9	8.4	6.8	3.1	5.1	16.3	27.2	27.2
35	Discovery Oostbank	—	1.2	6.5	86.0	6.0	0.3	—	—
42	Den Bril	—	—	44.9	55.1	—	—	—	—
56	Maety Miarang . .	—	—	23.0	55.0	15.2	6.8	—	—
<i>October.</i>									
29	Seribu Dolok . . .	4.4	8.4	5.5	1.9	8.7	15.7	24.7	30.7
35	Discovery Oostbank	4.3	3.6	5.2	62.2	11.3	2.3	5.2	5.9
42	Den Bril	0.3	—	42.6	49.4	7.7	—	—	—
56	Maety Miarang . .	3.9	5.6	24.0	57.7	6.0	2.2	—	0.6
<i>November.</i>									
29	Seribu Dolok . . .	4.1	7.6	1.8	—	6.6	22.1	23.4	34.4
35	Discovery Oostbank	4.1	16.0	4.7	22.6	4.1	10.9	20.2	17.4
42	Den Bril	3.0	0.7	41.6	30.6	8.9	1.6	11.6	2.0
56	Maety Miarang . .	5.6	6.1	17.7	37.4	18.2	11.6	—	3.4
<i>December.</i>									
29	Seribu Dolok . . .	9.8	16.8	8.1	1.7	6.5	17.9	16.7	22.5
35	Discovery Oostbank	5.9	2.8	0.5	1.3	3.3	14.3	31.8	40.1
42	Den Bril	11.5	3.6	2.3	—	4.6	3.2	51.2	23.6
56	Maety Miarang . .	8.6	0.6	4.4	10.2	11.8	20.8	18.2	25.4

TABLE III

MEAN MONTHLY AND ANNUAL TEMPERATURE

No.	Station.	Years of Observation.	Jan. ° F.	Feb. ° F.	Mar. ° F.	Apr. ° F.	May. ° F.	June. ° F.	July. ° F.	Aug. ° F.	Sept. ° F.	Oct. ° F.	Nov. ° F.	Dec. ° F.	Year. ° F.
JAYA:															
1	Banyuwangi .	7	80.2	80.1	80.8	81.1	80.2	80.1	78.8	79.0	79.3	80.4	80.6	80.4	80.1
7	Tosari . .	4	62.2	61.3	61.2	61.0	61.2	60.3	59.2	58.6	59.5	60.3	60.4	61.2	60.6
13	Batavia . .	35	77.5	77.8	78.6	79.3	79.6	78.9	78.4	78.8	79.4	79.7	79.2	78.2	78.8
18	Buitenzorg .	15	76.3	75.7	76.5	77.4	77.4	76.8	76.0	77.0	77.5	77.5	77.2	76.3	76.8
19	Chipetir . .	6	72.1	72.1	72.3	73.0	73.0	72.5	72.1	72.0	72.3	72.3	71.8	71.8	72.3
SUMATRA:															
22	Singkel . .	7-8	80.2	80.6	81.0	81.1	81.0	80.6	80.1	79.9	79.7	79.3	79.7	80.1	80.3
24	Lahat . .	7	79.2	79.7	80.6	81.1	80.8	80.4	80.1	79.7	79.9	80.8	79.9	79.3	80.1
25	Palembang .	5	79.7	80.0	80.7	80.7	81.1	80.3	80.0	79.9	81.0	80.8	80.6	79.8	80.4
28	Toba . .	5-6	69.8	69.6	69.6	69.4	69.8	69.8	69.8	69.6	69.4	69.6	69.8	69.8	69.6
BORNEO:															
37	Banjermasin	9	80.2	80.4	80.8	81.3	81.5	80.8	79.5	79.9	80.8	81.4	80.9	79.9	80.6
CELEBES:															
46	Tomohon . .	12	69.8	70.0	70.7	71.2	71.6	71.2	71.2	71.1	71.1	71.4	70.9	70.2	70.9
51	Amboina . .	5	80.8	81.0	80.6	79.3	79.3	78.4	77.4	77.7	78.1	79.2	80.4	80.8	79.3

TABLE IV
MEAN MONTHLY AND ANNUAL RAINFALL IN INCHES
MEAN ANNUAL NUMBER OF RAIN DAYS

No.	Station.	Years of Observation.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.	Rain Days.
1	Banyuwangi .	33	8.82	7.44	5.79	3.94	3.78	4.45	3.03	3.07	2.77	2.99	3.54	7.56	56.58	101.3
2	Assembagus .	17	7.64	6.97	5.08	2.24	1.89	1.97	1.30	0.04	0.24	0.20	1.81	5.39	34.77	68.2
3	Kudus .	34	20.79	17.17	12.56	6.26	3.86	2.32	1.69	1.38	2.09	4.25	6.97	14.61	93.75	134.0
4	Pugar .	26	8.03	8.43	7.52	4.25	3.58	2.21	1.42	0.55	1.34	2.28	6.70	8.78	55.09	80.5
5	Patigian .	32	13.86	14.65	10.75	6.06	5.63	5.67	3.19	2.64	2.52	8.47	12.99	15.12	101.55	141.9
6	Kalisat .	21	12.87	11.58	10.04	5.39	4.17	1.97	1.46	0.43	0.47	0.71	4.25	9.06	62.40	107.7
8	Sirah Kuchong .	11	32.75	32.95	29.92	18.70	16.58	11.34	5.87	5.59	6.26	15.28	27.91	32.47	235.62	210.8
9	Kediri .	33	11.02	10.87	9.96	7.13	4.72	3.15	1.50	0.55	0.98	2.28	5.35	9.80	67.31	98.8
10	Surakarta .	33	12.80	12.95	12.09	7.87	5.51	4.17	2.60	2.09	1.85	4.49	9.09	10.28	85.79	128.5
11	Cheribon .	28	16.97	14.37	13.58	7.87	5.79	4.21	2.99	0.98	1.38	2.68	5.75	14.21	90.78	129.4
12	Edam .	22	15.00	12.24	6.34	3.82	3.50	3.27	3.03	2.68	2.52	2.09	4.17	7.83	66.49	88.3
13	Batavia .	36	12.01	12.44	8.43	5.20	4.37	3.94	2.91	1.42	2.91	4.33	5.83	7.52	71.31	136.9
14	Kobumen .	22	12.28	11.81	13.27	8.19	6.30	5.59	3.15	2.48	3.43	10.59	15.12	15.24	107.45	123.4
15	Chilachap .	33	11.26	10.00	11.97	10.87	11.26	13.90	10.59	9.02	9.29	18.50	19.92	15.67	152.25	192.1
16	Kranggan .	7	27.99	22.91	27.48	27.21	20.98	12.68	19.61	25.24	26.58	47.24	38.85	30.20	326.97	229.3
17	Bandung .	32	7.76	6.77	9.57	9.02	5.51	3.47	2.91	1.93	3.19	6.58	9.17	8.82	74.70	143.5
18	Buitenzorg .	36	17.40	15.63	15.43	15.91	14.10	10.75	10.12	9.92	12.84	16.73	16.06	13.74	168.63	221.3
19	Chipetir .	9	11.02	11.42	12.48	12.13	8.27	5.04	5.04	6.85	5.67	12.84	11.85	14.33	116.94	197.9
20	Menes .	8	20.04	17.01	20.55	15.79	9.92	9.21	5.59	7.76	6.97	16.38	23.50	24.37	176.89	198.7
SUMATRA:																
21	Pulo Tello .	7	15.63	13.74	14.10	11.34	14.45	14.49	16.14	15.59	17.24	23.43	22.76	16.93	195.84	205.9
23	Kuta Raja .	33	5.51	3.31	3.62	4.06	6.10	3.82	4.25	4.72	6.65	7.32	7.32	8.89	65.66	124.2
26	Lubu Sikaping .	21	15.08	11.69	13.70	17.80	12.13	9.84	8.58	12.56	13.35	20.59	16.93	17.68	169.93	240.8
27	Balige .	15	6.34	6.58	7.32	7.32	5.04	4.33	2.40	4.45	5.08	8.39	6.73	8.27	72.25	154.5
30	Bengkalis .	32	6.30	5.95	7.21	10.28	7.40	5.67	5.12	6.73	9.65	11.50	12.64	11.69	100.14	153.7
31	Lho Seumawe .	17	6.46	2.56	2.44	3.23	3.90	2.99	2.56	3.78	4.02	6.38	7.36	12.80	58.48	102.4
32	Bintang I.: Tan- jong Pinang .	36	12.84	6.70	8.19	10.47	9.73	8.62	7.21	8.74	8.43	11.73	12.36	15.00	120.02	160.1
33	Banka I.: Muntok	33	16.69	11.65	12.44	10.00	7.44	4.88	4.37	4.57	4.25	7.76	13.23	21.02	118.30	159.2

(Continued on following page)

TABLE IV (continued)

No.	Station.	Years of Observation.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.	Rain Days.
34	Biliton I.: Tan- jong Pandan.	36	11-14	6-61	7-87	10-95	9-45	7-60	7-25	5-67	6-46	10-79	14-41	16-30	114-50	192-2
BORNEO:																
36	Pontianak.	33	10-63	7-56	9-41	10-51	10-08	8-66	6-14	9-25	8-15	15-36	15-32	13-39	124-46	182-5
37	Banjermasin.	33	12-91	11-77	12-01	8-47	6-77	6-06	4-21	3-94	3-70	5-55	8-62	13-11	97-12	180-3
38	Bulungan.	18	12-09	10-16	11-69	9-41	9-17	7-21	8-50	9-76	9-65	9-73	1-06	11-26	119-69	194-3
39	Samarinda.	6	7-40	7-17	8-43	7-99	7-13	6-10	4-02	4-53	4-41	5-71	6-54	9-29	78-72	168-8
40	Putus Sibau.	10	16-38	16-46	15-79	18-31	15-47	11-81	10-20	12-68	13-35	20-83	18-27	18-39	187-94	207-9
41	Amuntai.	33	12-21	11-46	12-84	9-73	7-72	5-32	3-86	2-84	3-15	5-00	9-65	13-11	96-89	153-0
CELEBES:																
43	Makassar.	33	27-48	21-65	17-44	5-83	3-27	3-43	1-50	0-43	0-59	1-73	7-64	25-12	116-11	132-8
44	Palu.	6	1-58	2-32	1-77	1-34	1-89	3-07	1-38	1-85	0-71	0-87	2-80	1-34	20-92	77-0
45	Menado.	33	18-15	14-84	11-30	8-07	6-22	6-65	5-00	4-13	3-50	4-80	9-13	4-69	106-48	167-0
47	Gorontalo.	31	4-33	4-29	3-94	4-96	4-02	4-96	3-70	3-54	1-73	2-80	4-02	5-16	47-45	101-0
48	Sangi I.: Taruna.	19	17-01	14-80	10-00	13-23	12-64	12-24	11-85	8-11	8-11	8-70	14-41	19-49	150-59	195-0
MOLUCCAS:																
49	Ternate.	33	8-31	7-05	6-89	8-78	9-17	8-11	5-51	4-33	4-13	5-67	7-87	8-43	84-25	150-0
50	Ceram: Amahai.	31	4-29	8-90	5-51	7-68	12-13	15-20	17-28	15-71	8-90	5-79	4-17	4-21	104-77	127-1
51	Ambolna.	36	5-20	4-49	5-43	10-55	20-43	25-16	23-70	15-75	8-50	6-38	4-37	5-67	135-63	202-3
NEW GUINEA:																
52	Windsor.	8	12-68	13-43	12-56	10-04	11-22	14-61	10-32	9-88	9-29	10-00	8-23	10-83	133-09	224-8
53	Merauke.	13	11-81	9-17	9-33	7-91	5-63	2-48	1-50	1-18	1-93	1-78	4-06	6-46	62-64	116-6
54	Aru Is.: Dobo.	16	10-04	10-63	7-76	7-95	6-38	6-10	4-84	2-68	2-21	4-06	6-46	9-65	78-76	145-8
55	Kai Is.: Tual.	28	13-58	10-12	12-21	9-88	8-35	5-83	5-00	2-44	1-93	3-27	6-38	11-97	90-96	149-2
LESSER SUNDA IS.:																
57	Timor: Kupang.	32	16-18	14-65	8-62	2-44	1-30	0-43	0-24	0-12	0-08	0-59	3-86	9-88	58-39	79-3
58	Flores: Larantuka.	10	6-73	7-99	9-96	4-25	2-28	1-54	0-59	0-67	0-08	1-77	4-57	7-01	47-44	77-9
59	Sumba: Waingapu.	8	6-58	5-75	6-02	3-27	1-30	0-32	0-00	0-43	0-04	0-12	1-30	4-69	29-82	63-7
60	Sumbawa: Bima.	31	8-03	8-11	7-21	5-63	2-36	1-54	0-67	0-36	0-59	1-54	5-04	7-91	48-99	93-0
61	Lombok: Selong.	20	8-54	8-35	5-95	2-36	1-14	0-91	0-79	0-47	0-39	0-55	2-36	7-17	38-98	70-8
62	Bali: Singaraja.	32	9-29	9-06	7-87	3-90	2-44	1-65	0-51	0-24	0-12	0-43	2-72	6-97	45-20	84-7
63	" Negara.	29	8-70	7-91	6-93	5-47	3-82	4-27	2-40	3-27	2-95	6-30	8-03	9-17	69-20	120-0

CHAPTER IV

VEGETATION AND ANIMALS

VEGETATION

As by far the larger part of the Malay Islands has fairly constant rainfall all the year they have also a very rich and luxuriant evergreen vegetation, the typical tropical rain-forest. The towns and villages of Sumatra, Borneo, New Guinea, the Moluccas, and the larger part of Celebes and Java, are buried in vegetation ; even in Java, patches of sandy shore or bare lava peaks are exceptional, and in spite of the dense population about one-eighth of the island is still covered with forest, whilst a far larger comparative area of Sumatra is overgrown with natural vegetation. Borneo is one vast forest, and the same may be said of New Guinea, with the exception of some treeless tracts in the south. In the south-eastern islands, which have the most marked monsoon climate and consequently a more or less distinct dry season, many of the trees lose their leaves during the year ; these forests, which are termed the monsoon forests, approximate to the Australian type. Here and there, where dry winds prevail and the land is high, similar vegetation is found in the middle of country possessing elsewhere the typical tropical forest, and in Amboina and in Timor the climate, and hence the vegetation, varies on different sides of the island. The influence of the monsoon climate may be observed in East Java, where the forest becomes thinner, and contains a larger number of deciduous forms : going eastward the change becomes more marked, and the forest is sometimes entirely absent. There are teak and sapan forests in Bali and Sumbawa, and sapan-wood, coconut, sandal-wood, &c., are found in Flores and Sumba, the latter island also producing dye woods ; but Dutch Timor is only wooded in isolated spots on the mountains ; casuarina, sandal-wood, and *eucalyptus alba* are found, but trees of the acacia and sisypus sort are commoner than forest trees, and vegetation is in general scanty. Alor is mostly covered with low trees and *alang-alang* grass. The tropical forest re-

appears again in Halmaheira. The trees appear to be little affected by the nature of the soil, but largely by the rainfall, whether periodical or constant, and by the height above the sea. Each island has a more or less peculiar flora of its own, which can again be divided into lowland, coastal, hill-country, and highland forms.

The differences between the flora of Java and Sumatra are considerable : not only different varieties, but different genera, appear in the latter island, and whilst the vegetation of the low damp land in Sumatra corresponds with that of the Javanese Mountains, the dry country has forms not found at all in Java. The pine (*pinus mercurii*), not found elsewhere in the East Indies, comes down to the equator in the north, and the distribution of vegetation does not seem to depend so closely on altitude as in Java. In general, the Sumatran flora has a far greater affinity with that of Malacca than with that of Java. The flora of Celebes, which shows many resemblances to that of the Philippines, is more Indian in character in the west of the island, and more Australian in the east : whilst the trees of the lower slopes differ strongly from those of Java, the alpine flora is very similar. The flora of New Guinea is distinctly individual to the island, though a large proportion of the forms occur also elsewhere, and some Australian varieties are found. Australian forms, such as the eucalyptus, occur also in the Moluccas, East Java, Sumatra, Celebes, and Timor, and on the mountain tops in Borneo, so that the flora of the archipelago cannot be divided into an eastern Asiatic zone and a western or Australian, as in the case of the fauna. The relations with the vegetation of Australia are on the whole small, and the flora of south-eastern Asia, the East Indies, Melanesia, Micronesia, and Polynesia are usually placed together, and described as having a distinctively south-Asian character.

Coastal Vegetation

Many parts of the swampy, low-lying coasts of the larger islands of the archipelago are lined with mangrove-vegetation, largely composed of rhizophores, interspersed with *nipa* palms, and forming tidal forests. Such vegetation is found everywhere on the north coast of Java, but only at the river mouths in the south. It forms a bright green border of varying width along the shore, growing mostly in the land which is flooded

by every tide. The mangrove vegetation assists in the rapid silting up of the coast, since it forms with its tangled roots a barrier in which the mud brought down by the rivers is held. The broad river mouths and the brackish marshes above flood-level, are also lined in many places with marsh-forest, consisting largely of the *nipa* palm, *bakau* trees, fan, coconut, and pandanus palms, &c.

Forests

This coastal vegetation is succeeded in Java, Sumatra, Borneo, Central Celebes, the Moluccas, and New Guinea by the true tropical rain-forest composed mostly of dense and impenetrable masses of foliage trees, undergrowth, and creepers. In Sumatra and New Guinea, however, the undergrowth is frequently thin or altogether absent, owing to the exclusion of light by the thick trees, matted with creepers. In Sumatra the forest comes further down into the plain than in Java, beginning at a height of 300 or 400 ft., whilst the oak, chestnut, and similar deciduous trees which only occur on the highlands in Java, are found on the lower slopes in Sumatra. The whole of the mountain sides are thickly forested in all the above-mentioned islands and it is only at a considerable altitude that the trees give place to an alpine flora. In Borneo the forest ceases at about 3,000 ft., as a result of the damp, cold, cloudy atmosphere on the mountain-tops, and it begins to thin out at the same height in Celebes. In Java the forest rises to a height of some 7,500 ft., and in Sumatra it is only the highest mountain peaks that are not tree-covered, whilst in New Guinea trees still flourish at 11,000 ft. Above these altitudes such trees as occur are stunted and moss-covered, and are mixed with a flora which is partly Himalayan and European in type, and includes rhododendrons, cranberries, &c. The trees of Celebes and New Guinea are, on the whole, smaller and less fine than those of Java and Sumatra; in Java they average about 100 ft., many rising to as much as 180 ft., whilst Sumatra is the finest timber-producing island in the archipelago. All the islands, however, possess valuable timber trees, among which teak, ironwood, ebony, sandal-wood, sapan-wood, are the best known, teak forests being found only in Java and Madura, Bali, Sumbawa, the Kangean Islands, and in Muna and Buton off the coast of Celebes.

An extraordinary number of different varieties of trees are found, Java alone possessing some 1,500 growing over 15 ft. in height. The leaves of the rain-forest trees are usually laurel-like, so that the water drains rapidly from them. Palms, in particular the coconut, areca, *areng*, *lontar*, *nipa*, pandanus, fan and cabbage palms, are found everywhere in the forests, and are used for a variety of purposes. The sago palm forms the staple food of the population in the Moluccas and New Guinea, and is found also in Borneo and Celebes. The bamboo, which is employed in many ways, is widespread on the hills as well as on the plains, and the rattan, extensively used for basket-work, &c., is very common. The gum-producing trees, among them the benzoin and camphor trees, are very widespread, and all the islands are rich in fruit-trees. Creepers, lianas, ferns, orchids, pitcher-plants, &c., are characteristic, and there are many epiphytous forms, including species of rhododendra, the giant rafflesia, and numbers of arads and *oronidae*. The dangerous upas-tree and poisonous species of *euphorbiaceae*, &c., are found.

Grassland

Great areas in Java, and still larger parts of Sumatra, are savanna country, covered with coarse grasses, chiefly *alang-alang* and *glaga*, the wild sugar-cane. This grassland, which does not occur to any extent in Borneo or New Guinea, descends to within 700 or 800 ft. of sea-level in Sumatra; wherever the forest is cleared, the grasses begin to take possession, and once these are well-rooted the trees are only re-established with difficulty, though there are a few bushes and low trees, in particular the anana or pine-apple, the kratok, and the lantana, which are able to compete with them, and act as the pioneers of re-afforestation where the country is left entirely to nature. The lantana, an alien plant introduced, it is said, from Jamaica, has made itself very conspicuous in many parts, particularly in Preanger and Central Java. These grasses are a plague to the agriculturist; they seem to spring up more luxuriantly than ever when uprooted, and rapidly exhaust the soil, the only method of exterminating them being by burning, and subsequently turning out cattle to eat the new shoots. In many parts of Java and Sumatra the grass has taken possession of places where the forest has been destroyed by man, or has

covered land formerly in cultivation where the soil has been exhausted. In Java it is most widespread in the Preanger Regencies, and as a rule is most common at an altitude of 3,000 or 4,000 ft. *Alang-alang* grows mostly from 1 to 4 ft. high, but frequently reaches to the shoulder, and cuts the face and hands with the sharp-edged leaves: it has heads covered with silky white hairs. *Glaga*, which is from 8 to 12 ft. high, frequently occurs in clumps among the *alang-alang*. The latter grass is much used, in the absence of other materials, for roofing, and the young roots are employed as medicine, externally and internally. The grass-covered regions are the haunts of tigers.

Javanese Flora

Considerable differences exist between the flora of eastern and western Java, owing to differences of climate. The tropical rain-forest is found in the west as far as about 112° E. long. East of this line it occurs only on damp mountain slopes protected from the south-east wind, and elsewhere the trees are partly Australian in character, and include a number of periodically leafless forms. Thus the *rasamala*, highly typical of West Java, does not occur in the east, whilst the *casuarina montana*, equally common in the east, does not succeed at a corresponding height in the west. Dodocarps, the Javanese firs, and the big dipterocarps, are very common in the west, but are not found in the east, whilst oaks and laurels, and many other trees, occur in different varieties. The thick woods of bamboo of the east do not appear in the west, and the teak-woods, which prefer a comparatively dry climate, are also more common in the east. On the whole, the West Javanese vegetation is larger, more varied, and more luxuriant than that of the east, where leafy woods only occur in the plains, with xerophilous forms on the mountains. The low flora of the peaks above 7,500 ft., however, shows less variation east and west, since at a great altitude the climate is drier all over the island, and the three most common trees of the Javanese alpine flora, the *albizia montana*, *myrica Javanica*, and *vaccinia* or cranberry, occur all over the island.

The vegetation is of course influenced by the height above sea-level, as well as by the rainfall, the temperature, and the slope of the ground, and the flora of Java has been divided into

four vertical zones, representing approximately the country from sea-level to 1,750 ft., from 2,000 to 4,500 ft., from 4,500 to 7,500 ft., and from 7,500 to 10,000 ft.

(1) *Zone from Sea-level to 2,000 ft.*—In this zone the temperature varies from 74° F. (23° C.) to 79° F. (26° C.), so the vegetation is tropical in type. The marshy coasts are lined with rhizophores and *nipa* palms, and the flat sandy beaches, which are comparatively rare, are covered with creeping plants with coloured flowers; pandanus palms, standing alone or in groups, grow among the sand-dunes, and above the level of high tide. Where the tropical forest extends to the beach it is modified in various ways: two striking trees, which do not occur inland, *barringtonia speciosa* and *terminalia catappa*, are characteristic, and many other peculiar forms, mostly of low growth, are found. Epiphytic plants are rare, and the leaves of the trees are usually thick and fleshy, since the salt in the soil renders the rainwater less easy to absorb. Most of the coastal species are very widespread, since they bear fruit which floats long distances, and preserves its vitality for considerable periods. Inland the palms, largely *nibung* and *lankap*, with *gebang* in the west and *lontar* in the east, begin, reaching usually a height of 20 or 30 ft., and rising to an altitude on the hills of about 300 ft.: they are frequently found in long narrow strips along the coast at a distance of two or three miles inland. The plains and slightly sloping ground are frequently covered with *alang-alang* and *glaga*, and here and there thickets of bamboo, acacia and other shrubs from 20 to 30 ft. high form a link between the cultivated land and the forest. In this zone are the fields where rice, sugar-cane, tobacco, &c., are grown, and the buffaloes are pastured. The lower hills, especially when they are of limestone formation, are covered with thickets of acacia, figs, sterculia, with jasmine, rattan, and pepper-vines. The acacias form true woods between 400 and 1,300 ft., and the teak-woods are at their finest in Eastern Java between 750 and 2,000 ft.: teak thrives best in more or less calciferous soil, shedding its leaves in June and budding in October, and grows to a height of 100 to 150 ft. In the higher parts of this zone the tropical forest is found in full luxuriance where the country is undisturbed by man: the trees, plants, and creepers, unlike those of many tropical countries, have often gorgeous and abundant flowers, and form a dense forest in which exis-

tence is maintained at high pressure by a host of lofty trees and parasitic plants in enormous profusion. There is a remarkable preponderance of certain types, largely figs (including the waringin), magnolias, and *anonaceae*; in Eastern Java the character of the forest is in great measure determined by the casuarina or chimoro, which does not grow crowded together like the trees in the rain-forest. This lowest zone covers, of course, a far more extensive area than the higher zones.

(2) *Zone from 2,000 to 4,500 ft.*—The temperature in this zone varies from about 64° F. (18° C.) to 74° F. (23° C.), and in area it is about one-fiftieth of the former zone: it contains a much smaller number of varieties, and is the region more especially of tea, cinchona, and coffee plantations, and of maize and the sugar palm (*areng*). In the forest the tall trees are covered with ferns and large fungi, and there is a profusion of lianas, rattans, tree ferns, lycopods, tradescantias, &c., in the thick undergrowth: the ginger worts are very common. The trees are of different types to those of the hotter zone, even when they are of the same genus, and include bamboos in East Java, and numbers of enormous *rasamala* trees and *puspa* trees, with their large white flowers, in the west.

(3) *Zone from 4,500 ft. to 7,500 ft.*—This zone in which the temperature varies from about 56° F. (13° C.) to 64° F. (18° C.) covers only about one five-thousandth of the area of the first or hot zone; the rainfall is less, but varies considerably, and it is a region of clouds and mist. It lies mostly on the slopes of volcanic mountains, but includes several plateaux (parts of Tengger, Dieng, Ijen, &c.) and a number of swamps and lakes, luxuriantly surrounded and overgrown with grasses. There are numbers of tall trees—oaks, chestnuts, laurels, maples, &c.—which are mostly without large flowers, though there are many flowering shrubs and herbs, including rhododendrons and azaleas. The tropical forest gives place gradually in this region to forest typical of the temperate zone as to forms, though keeping a tropical character in its general features, and this gives way to casuarina, the Javanese pine, and *anggrang*, a species of elm, which is found in particular on Mt. Merapi and Mt. Kelut. There are few cultivated fields, except in the Tengger country where the natives grow rye, maize, and tobacco, and European vegetables, for the cultivation of which the region is well suited. In Western Java one of the most striking

features of the higher forests of this zone is the masses of mosses and lichens which cover the trees. Much of the lower vegetation begins to have a European aspect, with primulas, ranunculus, violets, &c.

(4) *Zone from 7,500 ft. to 10,000 ft.*—Only some twenty mountain peaks are included in this zone in Java : the ground is uncultivated and unfruitful ; the air is dry, and the temperature may fall below freezing-point at night. The few varieties of trees and shrubs, which include the casuarina, seldom reach a height of 30 ft., and are gnarled and knotted ; the woods consist largely of iron-wood in eastern and central Java, with myrtle, rhododendron, berberis, elder, honeysuckle, &c., and many alpine flora of European types. An epacrid, which closely resembles European heather, is common, and a characteristic shrub is *anaphalis Javanica*, commonly called the Javanese edelweiss. The highest mountain tops are covered with short grass and dwarf bushes.

Left to itself Java would rapidly clothe itself with even richer vegetation than when it was first occupied by man ; in twenty-eight years the site of the deserted fort of Nusa Kambangan was covered with thick forest, including trees 80 ft. high. The forest is often destroyed by the natives in a reckless manner in order to make cultivated fields, but the damp climate prevents forest fires attaining large proportions, and the natives have no use for large quantities of timber for the construction of their simple dwellings. Moreover, the Dutch Government is fully alive to the dangers of denudation both in Java and in the Outer Possessions, and the spread of the *sawah* as opposed to the *ladang* system of rice-cultivation will result in a diminution of the area of forest destroyed, since in the extensive *ladang* system exhausted fields are constantly being deserted for fresh soil, whilst the properly irrigated fields of the *sawah* system are kept permanently cultivated. The land which has once been under cultivation, and then has been deserted, produces only worthless and inferior timber, even when it is not occupied and overgrown with *alang-alang*.

ANIMALS

The fauna of the East Indies is very rich and numerous, and includes representatives of every order, though it is of

small economic importance since few of the animals form any considerable addition to the food-supply. The pig, one of the commonest wild animals, is forbidden to the Mohammedan peoples, and is only eaten largely in Borneo. Bats form a common article of food, but in most cases hunting is carried on as an amusement, except in the case of edible birds.

In the different islands may be found the animals typical of tropical forests, savannas, cultivated land, grass-land, marshy low-lying country hills, snow-mountains, high plateaux, shallow and deep seas, reefs, &c. The fauna of deserts, of continental steppes and rivers, of arctic regions, of salt-marshes, is absent. The character of the land and water fauna is determined chiefly by the tropical climate, which is fairly uniform all over the archipelago. The marked difference between the animal life of the western and of the eastern halves of the East Indies is thus probably due to the earlier separation of the eastern islands from the continental mass, the breaking up into more numerous islands, mostly of smaller size than in the west, greater exposure to volcanic eruption, and perhaps also to temporary immersion under the sea. The animals of the western islands have been, in some cases, unable to reach the eastern islands, and in other cases probably have died out after their arrival. The difference between the two fauna is so distinct that that of the western half is reckoned with the Oriental or Indian region, that of the eastern half with the Australian. The line between the two, 'Wallace's line', has been differently drawn by different students (compare Chap. I, p. 12). Wallace made it pass between Borneo and Celebes in the north and Bali and Lombok in the south. The latest authority, Sarasin, treats the Lesser Sunda Islands as a continuation of the Sumatra-Java line, and as a transitional district.

Mammals

The mammalian fauna of the western islands, the Indo-Malay region, is continental rather than insular in character, and bears a close resemblance to that of India. All the orders of mammals are represented, with the exception of marsupials and duck-billed animals; in the east of the archipelago it is just these orders which are characteristic, the other orders being almost completely unrepresented, except in the case of rodents and bats.

In the Greater Sunda Islands are found apes and monkeys ; tigers, panthers, leopards, and wild cats ; elephants and rhinoceros ; wild pig, wild cattle, and deer ; bears, porcupines, tapirs, lemurs, and many other less important and less numerous species. The domestic cattle—horse, buffalo, sheep, and goat—have all been imported. The majority of East Indian mammals are found also in the Asian continent, but the tapir occurs nowhere in the Old World but in Sumatra, Borneo, and Malacca. The rhinoceros is represented by a two-horned variety in Java, and a one-horned in Sumatra and Borneo ; it is dangerous at close quarters, though it is never met with in numbers, and is found not only in the coastal marshes, but at considerable altitudes. The elephants are found in north-east Borneo, and there is a peculiar variety in Sumatra, but they do not occur in Java ; they are not as a rule dangerous to man, but sometimes do extensive damage to ricefields near the forests. In Sumatra they are not tamed, but are hunted for their tusks. The royal tiger is found in Sumatra, Bali, and Java, where it is still common enough to make a tiger-hunt a characteristic scene : it is much feared and revered in Java, where it claims a considerable number of victims, but it is never systematically hunted, since it keeps the wild pig, which would otherwise destroy the crops, in check. Since the Government offered a reward for their destruction the tigers are said to be decreasing in numbers. The wild pig is very common in Java, Sumatra, Borneo, and Bali, and frequently damages the fields in Java ; it is largely eaten in Borneo. Tiger-cats and civet-cats are common ; in Sumatra there is a wild-dog, and there are many half-wild pariahs in the native villages. The Malay bear is found in Sumatra and Borneo ; it is harmless to man, but eats quantities of coconuts. The great wild bull (*banteng*) still lives in Borneo and Sumatra, and in uninhabited districts at an altitude of two to seven thousand feet in Java. Deer of different varieties are very common in Sumatra, Java, Borneo, and Bali ; their flesh is eaten in a dried state in Sumatra. In Java the *ranchil*, a graceful little faun, is the subject of many Javanese tales : the ‘forest-goat’, a mountain antelope, is found in Sumatra. Various species of apes and monkeys are found ; the largest, the orang-utan, is common in Borneo, where its flesh is eaten by the Dayaks, and occurs also in Sumatra. Of the long-armed apes, the *siamang* of Sumatra,

the grey *wouwou* of Java, and the curious 'long-nose' of Borneo are the best known. Rats, mice, flying lemurs, foxes and squirrels, and bats are numerous; the *kalang*, a fruit-eating bat whose flesh is frequently eaten by Europeans, does much damage to maize-fields, and to coconut and sugar palms. The myriads of bats on the cliffs produce a form of guano. The brown Norway rat is a plague. Badgers, otters and weasels are common, but there are no wolves, foxes, or jackals. In Java there is a curious animal, the *mydaus*, intermediate between a pole-cat and a badger, which lives only on the high mountains, and has an offensive smell.

The lack of many mammals, such as the orang-utan, the civet-cat, the bear, the tapir, and the elephant, places Java in a subdivision of the western islands as opposed to Sumatra, Borneo, and the Malay Peninsula. Celebes takes an isolated place by itself, especially with regard to its mammals, since there are animals which are found in every country between India and New Guinea, except Celebes; and, on the other hand, it possesses three large animals, the crested baboon, the *babirusa* or pig-deer, and the *anoa* or dwarf-buffalo, which are not found elsewhere, except that the crested baboon is met with in Buru, Sulu, and Bachian, to which islands it has probably spread from Celebes. The flesh of the *anoa* is extensively eaten. Celebes has far fewer mammals than the more westerly islands, and among them are two marsupials, but in many other respects its fauna is more Asiatic than Australian. A large number of the indigenous animals of the island are peculiar varieties, including five squirrels, a pig, a deer, and two wood-rats of an Australian type. The number of different species of mammals in the island is estimated at about 80, of which half are bats. There is a particularly ferocious wild pig.

Eastward the islands become successively poorer in mammals of the Indo-Malayan type, and the fauna becomes more clearly Australian. Bachian is the most easterly point where apes are found, and in the southern chain Timor has a single representative of the eastern marsupials, a cuscus, and a porcupine characteristic of the Asiatic fauna, as well as an ape, a long-eared wild cat, numerous small deer, and hosts of bats. The only indigenous mammals in the Moluccas are bats, some small shrews, and a cuscus; the deer which abound, and the civet-cat, have

probably been imported—the latter for its perfume, which is much appreciated by the natives.

The fauna of New Guinea, with the neighbouring Papua Islands, resembles that of Australia very closely, but has undergone separate development, and the forms, especially among the jumping animals, are less numerous. The tree-living animals are naturally better represented, the presence of any jumping animal, like the kangaroo, in a forested country like New Guinea being sufficiently remarkable; 139 mammals are known, including 39 bats, 50 marsupials, 42 rats and mice, 4 anteaters, and 2 pigs. The rats and mice are mostly forms peculiar to the Australian region; the marsupials include a kangaroo, a tree-kangaroo, a cuscus, striped and flying phalangiers, a bandicoot, &c.

Birds

The East Indies are very rich in birds of brilliant plumage though song-birds are rare. Parrots, cockatoos, and parakeets are more common in the eastern islands than in the west, and birds-of-paradise are only found east of Celebes. Java, Sumatra, and Borneo have, however, a great variety of birds: crows, orioles, cuckoos, doves, hornbills, honey-birds, &c., are common, and the rice birds and weaver-birds are a plague to agriculturists; the peacock is found in Java, and is regarded with aversion by the natives, as he is thought to follow the tiger in his hunting. In Borneo the rhinoceros bird plays a large part in Dayak mythology. There are no eagles, except in Borneo, but falcons, hawks, kites, and owls among the birds of prey. The peculiar martin which produces edible birds' nests, is found on the coasts, the most esteemed nests coming from Borneo. Among the birds useful to man are numerous partridges, pheasants, snipe, pigeons, storks, geese, ducks, and wild fowls, which are also kept in great numbers by the natives as domestic animals, and are thought to be the progenitors of barndoor fowls. There is also in Java and some of the Lesser Sunda Islands a beautiful jungle fowl, the *gallus furcatus*.

Celebes has a number of peculiar species of parrots and other birds, but its avifauna is more Asiatic than Australian in type. In contradistinction to the mammals, birds are very numerous in the eastern half of the archipelago. The genera, both of New Guinea and the Moluccas, are distinctively Papuan, but

many of the species are peculiar to different islands. The preponderance of parrots, pigeons, and kingfishers, and in New Guinea of birds-of-paradise, give to the bird-life a very brilliant appearance, since these birds are mostly over the average size and have exquisitely coloured plumage. The absence of ground game permits the survival of a number of ground pigeons and small bush turkeys, as well as the cassowary in New Guinea. The flesh and eggs of the turkey, which is found also in Celebes, are esteemed as delicacies. The skins of birds-of-paradise, which are of many different species, have been an article of trade for more than two centuries. There are many other remarkable birds, such as those allied to the Australian bower-birds, the brilliant racquet-tailed kingfishers, the crimson loris, and the mound-builders of the Moluccas.

Reptiles

Large crocodiles are common in Java, Sumatra, Borneo, Celebes, Timor, the south of New Guinea, &c. They are mostly *Crocodilis porosus*, wrongly called the caiman; they live chiefly at the mouths of the rivers, in salt or fresh water, but they also come up stream, and are a source of some danger. Like the tiger and other animals, they are honoured by the natives, a result of the belief in the transmigration of souls into animals. Lizards of all sorts swarm in ponds and marshes: two varieties, the beawak (*varanus salvator*), and the minyawak (*varanus bivittatus*), which are sometimes as much as six to eight feet long, catch and eat poultry; their flesh is eaten by the Chinese and the natives, and their skin sold as crocodile leather. Numbers of geckos enter the houses in search of flies; and different sorts of chameleons and monitors are found. Land and tree-frogs swarm, and turtles and tortoises, both the land and sea varieties, are common: their eggs are used as food, and one variety, the penju, provides good tortoise shell.

Large numbers of snakes exist all over the East Indies, living in the trees, the undergrowth, and the streams. A number of them are poisonous, but they are not a source of much danger since they use their fangs more for defence than for attack. Pythons are widespread as far east as Amboina, but are not dangerous: *python reticulatus* (ular sawah) is revered in Java, where it destroys large numbers of mice in the ricefields.

The ular ribu (*cylindrophis rufa*), which is about 2½ ft. long, with a red ring round the neck, the ular tanah, a sort of adder, and the ular balang, which is virulent when roused, are among the most common varieties in Java. The hat-snake (*ophiophagus elaps*) which is sometimes 12 ft. long, is the most dangerous and the quickest-moving of the East Indian snakes ; it takes its name from the manner in which it erects the skin on its neck when enraged. The cobra di capello, the hooded cobra, which reaches a length of 5 to 10 ft., only shows itself in the morning and evening. Sea snakes, varying from 2 to 6 ft. in length, are found in all parts of the Indian Ocean.

Insects

There is an amazing variety and abundance of insect life in the East Indies ; everywhere there are numbers of large and exquisite butterflies, moths, and big beetles, including a bird-killing species in Java : the butterflies and beetles of the Moluccas are specially noticeable, and Celebes has many peculiar species. In many places malaria-bearing mosquitoes, sandflies, ants, and termites are plagues, and hornets, bees, wasps, scorpions, centipedes, and cockroaches are common. The honey and wax of the wild bee are collected by the natives. The crops in Java are often extensively damaged by little-known pests, in particular a bug called walang sangit, which is very destructive to rice in the ear. The numerous ants are useful in so far as they clear away quantities of garbage and refuse, but some varieties inflict very painful bites. Various blood-sucking insects are much feared as they frequently cause suppurating wounds, and are a great annoyance in jungle country to men and beasts. The marshes and forests of Borneo swarm with tree- and horse-leeches.

Fishes and Marine Fauna

The seas and rivers of the East Indian archipelago swarm with fish of many kinds, and fish is of great economic importance, since it forms, after rice, the chief food of the natives, who are often extraordinarily expert and ingenious fishermen. The seas might be made to yield a far more considerable harvest than they do at present, and the fishing industry is only of more than local importance in a few places. In Java some

380 species are said to be used as food at Batavia by the natives and Chinese : the latter have added gold-fish, which grow to a large size, to the number : perch is the salt-water fish most eaten by Europeans.

The rivers and marshes of Java, Sumatra, and Borneo produce very large numbers of fresh-water fish of many species, all distinctively Indian or Asiatic in character. In the more easterly islands, on the contrary, there are fewer varieties of fresh-water fish, and a proportionately larger number of migratory fish (which penetrate up the rivers from the sea), fish which live in brackish water—eels, &c. There is a most distinct cleavage between the fresh-water fishes of Borneo and Celebes, and the same change is observed, though it is more gradual, between Java and Bali. The most esteemed fish which, are brought to market by the natives are tengiri, the bandeng, the gurami, the tembrar, and the kakap : the first is a river fish, the last a sea fish, and the others are caught in pools and fish-ponds.

Crabs, crayfish, lobsters, turtles, &c., are found in great numbers. Pearl-fisheries are carried on off the east coast of Celebes, in north-east Borneo, in the seas round Amboina and Ternate, and off the Aru Islands. Trepang (*holothuria edulis*) is caught and dried in Saleier, and the islands off the coast east of Celebes, and in the Moluccas. Whales are found in many parts of the East Indian Seas, and include the cachalot, which produces ambergris, *zygaena* and *carcharias glaucus*, which are much dreaded in the harbours. The dugong is also met with off the Javanese coast.

CHAPTER V

INHABITANTS : GENERAL CONSIDERATIONS

Population : Numbers—Native races—Europeans—Half-castes—Relations between Dutch and natives—Oriental foreigners (Chinese—Japanese—Arabs—Hindus)—Languages—Religions (Mohammedanism—Christianity—Confucianism)—Education—The Press—Health.

POPULATION : NUMBERS

THE population of the Netherlands Indies may be divided into the natives, whose numbers are imperfectly known in many parts, but who are reckoned as numbering some 46,900,000 ; the foreign Orientals, who numbered 770,640 in 1912 ; and the Europeans, of whom there were 104,837 in 1912.

NATIVE RACES

There has been considerable controversy about the origin of the native peoples who exist in enormous variety in the East Indies. They are now usually divided into three chief races—the Indonesians, the Malays, and the Papuans : it is still doubtful whether any members of a fourth group, the Negritos, who are found in the Malay Peninsula and in the Philippines, exist in the Netherlands Indies, and whether they once formed the indigenous population of part of the archipelago. The Indonesians, who probably formed the indigenous population in most of the islands, are represented to-day by such races as the Baduj in Java, the Bataks in Sumatra, the Dayaks in Borneo, and the so-called Alfurs in Celebes and the Moluccas. The chief peoples of the western half of the archipelago, however, are of Malay race (the use of the word in this sense must not be confused with its use as the name of one of the peoples of Sumatra). This people, coming from south-eastern Asia, pressed the Indonesians back into the interior of the islands, and settled on the coasts : they are represented to-day by such peoples as the Javanese, Madurese, and Sundanese in Java, and the Achinese, Malays, Menangkabau Malays, &c., in

Sumatra. Probably the Indonesians represent the original Malay type, the proto-Malays, since the Malays are a mixed race, modified by Hindu and Chinese strains in the west of the archipelago, and by Papuan blood in the islands lying nearer New Guinea. All over the archipelago the indigenous peoples, the Indonesians, are shorter than the Polynesians : the Dayaks average 5 ft. 2 in., the Bataks 5 ft. 3 in., and the Gorontalese 5 ft. 2 in., whilst the Polynesian peoples vary from 5 ft. 7½ in. to 5 ft. 9 in. The dwellers in the lowlands are on the whole smaller than the highland peoples. The Malay peoples are taller than the Indonesians, though smaller than Europeans : being a mixed race, they present a variety of types, but are generally speaking Mongolian, and bear an obvious resemblance to the East Asiatic peoples. The skin is light brown or light yellow, and the hair black, straight and stiff, with little growth on the face or body ; the nose is short and flat, with a pointed tip and broad nostrils, the eyes dark and slightly oblique, the cheek-bones prominent and the mouth large ; the body is well formed, and strong, but somewhat slender.

In character the Malay peoples are reserved, and slow and quiet in speech : they are thriftless and careless—often lovers of gambling, opium, and women—and have no desire to work for a problematical future prosperity. They are usually courageous, and often proud and vindictive, eager to avenge an injury : the memory of the past and their easily hurt susceptibilities have often rendered them difficult to manage ; but they have all a keen intelligence and are capable of improvement, and under their mask of reticence they are generally well-disposed and polite towards strangers.

New Guinea and the surrounding islands are peopled by Papuans, a race which differs largely from the Malays and Indonesians, a fact which may be correlated with the comparatively early severance, in geological time, between New Guinea and the other main islands of the Archipelago. The Papuans are taller than the Malays : their skin is almost black, and they are largely negroid in type, though their heads are usually dolichocephalic. In character also they are the antithesis of the Malay, since they are cheerful, boisterous, and passionate, giving impulsive expression to their feelings, and very suspicious of strangers, all of which traits make them difficult to deal with.

EUROPEANS

Netherlands India forms an example of restricted colonization by a small nation which is unable fully to utilize the resources of its possessions, and is therefore all the more determined on intensive exploitation and the turning to good account of the territory already occupied, which has been only very slowly extended. Methodical colonization, combined with an administration which aims at improving the lot of the native and making the best economic use of the country, dates only from 1860, and the number of Europeans in the islands has almost doubled since 1890.

In 1912, out of the 104,837 Europeans in the Netherlands Indies, there were 86,681 in Java and Madura, and 18,156 in the Outer Possessions: Java, which forms only 7 per cent. of the area of the islands, contains 80 per cent. of the European population, and this is 1 per cent. below the European population of Ceylon, taking the relative size of the islands into consideration. Half of those living in the Outer Possessions are in Sumatra, especially on its east coast. It is expected that the number of Europeans in the Outer Possessions will increase rapidly. The above figures do not include the 12,000 Europeans in the army or the 2,200 in the navy; in Netherlands India, where there are few white working-men, the soldier forms a class apart, though after his discharge he frequently finds a place in European society as an overseer or other official.

Netherlands India is not a 'colony of officials', since there are in all under 9,000 Europeans in official positions: the majority of the Europeans are engaged in agriculture, as owners or tenants of plantations, or in trade in the larger towns. The number of male adults with no definite occupation (about 9,300 exclusive of pensioned government servants) is very high, and consists mostly of half-castes (see p. 128).

European society in the East Indies really means Dutch society, since 92 per cent. of the Europeans are Dutch, though only 7 per cent. of these are actually born in Holland. Foreigners quickly merge into Dutch society, except round Deli in Sumatra, a young colony with a more international character. The Germans, of whom there were 1,400 in 1905, are the most numerous European people after the Dutch: half of them were

in the Outer Possessions, chiefly in Sumatra. They are said largely to have increased in numbers during the war : rumours of their activities have been referred to in Chap. I, and they have endeavoured to extend their commercial interests with a view to development after the war. There were in 1905 300 British, 300 Belgians, with small numbers of French, Americans, Austrians, Australians, &c.

The Dutch in the East Indies, who are as a rule friendly and generous, live a simple family life, and stand a prolonged stay in a hot climate well, since they adopt native customs as far as possible : the improvement in communications has made life in the archipelago much easier than was formerly the case, but although there are still many Dutch who spend their whole life in the islands, there is an increasing tendency to treat the East Indies as a transitory home. It is not, however, necessary for the children to return to Europe as is the case in British India, since the climate is less trying, but they are usually sent home to be educated. There is a much higher proportion of white women as compared to white men than in India : in Java for each 100 white men there are 89 white women.

The European houses are open, airy, and simple, and stand some way apart, often in magnificent gardens ; they have a verandah in front and at the back, and the walls are painted white inside and out. When they do not stand on piles the floors are of stone, marble, or cement. They are usually only one story high, except in some of the larger towns in Java where land is becoming scarce, but even in Java the towns retain a good deal of the village in appearance, and are full of trees. The European women commonly wear native dress, the *sarong* and *kabaya*, but in the towns, and in the cooler interior of Java, light European clothes are becoming more and more usual, especially among the younger women.

The Dutch work hard : office hours are from 8.0 to 3.0, and business is transacted from 9.0 to 6.0 ; the midday rest is no longer universal. The midday meal of rice and its concomitants, the ' rice-table ', is being given up by some of the Dutch, and every one has a European dinner at night. Hotels are numerous, since they are subsidized by the Government in places where they would otherwise be unable to pay their way.

HALF-CASTES

Although there are now nearly as many white women as white men in the Netherlands Indies, this was not the case in the past, before the improvement of communications, and hence of the comforts of life, made existence easier for white women. The Dutch used to regard the natives and their women as instruments to be used for their convenience, and it was usual and conventional for each man to have a native mistress or wife. The children of such unions are regarded as Europeans in the East Indies, even if they speak a native tongue and live as natives, and though the number of half-castes born is considerably lower than formerly, they are still far more numerous than the pure-blooded whites, and form the real 'colonists', since the pure-blooded Dutchman is almost always anxious to return to Holland when his fortune is made. Every post is open to the half-castes, and in the administration, the army, and in industrial undertakings, they outnumber the white men. There are all grades of colour, civilization, and education among them, and the best, who are indistinguishable from pure Europeans, compete successfully with them, but they are frequently badly brought up, having often been deserted by the father on his return to Holland, or on his marriage to a European. Whilst they consider themselves above manual labour, many of them are too lazy and incompetent to get other employment, and drift between Indian and European society, forming a discontented and miserable class. During the last ten years training schools for half-castes have been opened, and they are being induced to work as tailors, hair-dressers, carpenters, and mechanics. But they are not strong, and prefer office work, however poorly paid, to any work involving physical labour. They usually marry a wife of their own class, and bring up a family in the islands.

RELATIONS BETWEEN DUTCH AND NATIVES

The Dutch administration in the East Indies, as it affects the natives, is on the whole wise and able, and very efficient in making the best use of the country and its inhabitants from an economic and financial standpoint, as far as is possible in territory so little developed as are the majority of the East Indian islands. The Dutch appear to have now a genuine

desire to improve native conditions, though their system often bears hardly on the individual. It has always been necessary for them to work with the natives in the task of administration, and to adopt and use as far as possible the native organizations, since the white men are not numerous enough to grapple with the whole task. The natives are left largely under the rule of their own head-men (see Chap. VIII), and though this often results in cases of hardship, the administration of justice being in the hands of an ignorant body of men, flagrant injustice seems comparatively rare. The whole tendency of the Government is towards the fostering of close and intimate relationships between Europeans and natives, and this tendency is helped by the extensive knowledge of native tongues demanded of officials, but the ideal is frequently not carried out in practice, since the Dutch are sometimes high-handed in their treatment of the natives, demanding a great deal in the way of servile respect for their personal dignity, and always intent on extracting the largest possible amount of labour from their employees. The natives of the East Indies are notoriously difficult to deal with in this respect, but the system of indentured labour in force in the archipelago, both in private and in government undertakings, is difficult to justify. It arose from the difficulty of arousing any desire to labour in a native whose simple wants are satisfied with a minimum of exertion on his part, and who is unaccustomed to make provision for the future. Before the arrival of the Dutch the institution of credit-bondage, or temporary enslavement of debtors, was very common, and though the Dutch put an end to that, it has been succeeded by the labour system detailed in Chapter IX, which, though deplored, is found necessary by all employers, while the natives seem able to protect themselves against their employers. Great difficulty is experienced in preventing them from breaking their contracts, usually for insufficient reasons; and as all such breaches of faith have to be taken before a regular tribunal, making the securing of a conviction a matter of some difficulty, there is little redress against the fitful and untrustworthy ways of the average native.

ORIENTAL FOREIGNERS

Natives of the neighbouring eastern lands arrived in the archipelago earlier, and in much greater number, than the

Europeans. They numbered 616,000 in 1905, and were thus seven and a half times as numerous as the Europeans. They are classed together by the Government as *Vreemde oosterlingen* (Oriental foreigners), divided for purposes of administration into Chinese, Arabs, and Hindus, and thus form a group apart from both Europeans and natives but placed as a rule on a level with the latter. The Japanese, as will be seen, rank with Europeans.

CHINESE

In 1912 there were 295,000 Chinese in Java and Madura, and 385,000 in the Outer Possessions. Thus their numbers have been doubled in Java in the last half-century, and quadrupled in the Outer Possessions: they have settled everywhere, and in some islands, such as Sabang in the Riouw Lingga Archipelago, they form the majority of the population. Large numbers of immigrants from China have been imported by a German firm in Deli, where they are invaluable on the tobacco plantations. The majority of the Chinese immigrants in Netherlands India are drawn from the poorest classes, and many of them come in order to amass a fortune with which to return to China. They are mostly natives of the southern provinces of Fukien and Canton.

The Chinese born in the archipelago are called *paranakans*, whilst those born in China are called *singkehs*, the former being more numerous in Java, and the latter in the other islands. The *singkehs* are as a rule stronger in physique, and so are more in demand on the plantations and in the mines of Sumatra.

Since Chinese women seldom emigrate, the Chinese of the archipelago usually marry native wives, but they preserve all their national characteristics, and until the new movement in China made itself felt, they observed very strictly all their ancestral customs, both religious and social, so that even after the women have for generations been natives, a Chinese family remains a race apart, holding aloof from both natives and Europeans. They avoid any contract which would place them in a very subservient position, and rarely work as domestic servants, as they so frequently do in other countries. As a race they are extraordinarily industrious and thrifty, and enrich themselves with great rapidity: they are intelligent, shrewd, and law-abiding, crimes being less frequent among them than

among either Europeans or natives. This industry and careful economy has enabled them to become the chief landowners, merchants, and money-lenders of the archipelago ; the careless, thriftless, and unpractical natives are at their mercy, and their oppression of those in their power, and their lack of any moral standard in their commercial dealings have made them exceedingly unpopular with Europeans and natives alike. They are invaluable as pioneers, and in the opening up of uncivilized and undeveloped islands for purposes of trade ; and whilst the sudden removal of the Arabs and Hindus would scarcely affect the economic life of the archipelago, the Chinese form an integral part of its foundations.

Their primary calling is trade, and they are the indispensable middlemen between the European wholesale importer and the native consumer. The chief article of their trade is linen, with which the Chinese pedlars penetrate to the most remote villages, making enormous profits : at several ports they carry on a brisk trade with Singapore, China, and eastern Asia in general, and they smuggle opium in old, discarded steamers, since the right of farming it has been denied them. Many Chinese own estates, mostly near Batavia, Tangerang, and Meester Cornelis, and there are more coloured land-owners than European : they also frequently work sugar-factories, and the number of Chinese craftsmen—smiths, carpenters, &c.—in Java, where only some 9,000 work as agricultural labourers, is increasing. Trade disputes are settled by the Chinese trade-unions in Batavia and Surabaya.

Widespread reforms have been effected by the Dutch in their treatment of the Chinese, since the latter formulated their grievances. In 1908 the native schools were opened to them freely, and Chinese governmental schools, on the same lines as the European primary schools, were started, thus establishing the principle that Asiatics may claim the same education as Europeans, and that the intellectual development of the Chinese is a matter of public interest. In 1912 the whole system of justice was revised, and a start was made to administer justice with the same procedure and the same judge for all classes of society. The Dutch civil code has borne hardly on the Chinese in many cases, since by Chinese law the family, personified in the father, is the legal unit ; division of property and its possession by women is forbidden, and no common understanding

between the European law recognizing the rights of the individual, which is in force in the Indies, has ever been reached, though an effort is now being made to bring the Chinese under the European system, except in so far as their laws of adoption are concerned.

In 1910 the system by which Chinese were forced to inhabit quarters set aside for them, and were not allowed to travel without a pass, was revised. This system was rendered necessary by the uncleanness and neglect of domestic hygiene shown by the Chinese. They are now allowed to live where they like in villages where no Chinese quarter exists, though in the 240 towns in Java and the 270 in the Outer Possessions where such quarters are in existence they are still compelled to inhabit them. These quarters are provided for colonies of over 100 Chinese : they are under Chinese heads, often unpaid and hereditary, who are appointed by the Government, and are independent of the local native authorities. These head-men have great importance in West Borneo, where the Chinese do not understand Malay, and speak only their own language, and in a place like Medan, where they are wealthy property-owners. Above the heads are five chief advisory officials appointed by the Government, whose influence is being gradually undermined by the growth and activity of Chinese trade-unions and revolutionary clubs. The Chinese may now travel to capital towns or to markets by road or rail without a pass, and their head-men and members of councils are exempt from the pass and quarters system. Since 1910 the Chinese, in common with every one else born in the Netherlands Indies, are regarded as Dutch subjects.

The whole aspect of Chinese society in the Netherlands Indies is changing with the growth of education, and with the gradual disappearance of the old Chinese social and religious life since the revolution : the pigtail has been discarded, and European customs, even as regards funerals and marriages, are everywhere being adopted.

JAPANESE

Holland, like other powers, has had since 1896 a treaty with Japan which places Japanese subjects on an equality with Europeans. The Japanese in the East Indies, who are the newest arrivals in the archipelago, have thus a considerable

prestige with the natives, but take no part in European society. Formerly they were mostly acrobats and female prostitutes, or followed various indefinite callings, but there are now a growing number of Japanese traders, a large proportion living in the Outer Possessions. It is clear that a very great development of Japanese interest in the Archipelago has taken place in recent years, and continues.

ARABS

The great majority of the Arabs in the Dutch East Indies came originally from Hadramaut, and Arabs from other parts, such as Baghdad, are usually undesirable from a political, an economic, or a moral point of view. There were no definite Arab settlements before the early part of the nineteenth century, when the opening of the Suez Canal facilitated communications, but in 1905 there were 19,148 in Java and Madura, and in 1912, 4,145 in Sumatra, and 3,738 in Borneo. Poverty is the usual incentive to emigration. Unlike the Chinese, the Arabs are quickly merged into native society : their own women seldom leave Hadramaut, so that they frequently marry native wives, who continue to wear native dress, and do not veil in the presence of men : their children speak Malay instead of Arabic, and they themselves often change the customs of Hadramaut and lose the Semitic traits in their character. This is particularly the case among lower-class Arabs, or those living in small settlements. The upper-class Arabs often send their sons to Hadramaut to finish their education. All classes of Hadramaut society are represented in the archipelago—the *seyyids*, the religious nobility ; the *qabili*, the ‘ members of the race ’, who always wear arms ; the burghers, the largest class, who may not wear arms ; and the *bedouin*, the nomads, who live almost exclusively by cattle-rearing. They are not united among themselves, and the superior classes oppress their inferiors. They intermarry with all classes in the archipelago, and the royal dynasties in Bantam and Cheribon in Java, and in Siak, Aceh, and other places in Sumatra are of Arab descent.

Most of the Arabs in the East Indies are occupied with trade, and like the Chinese they form a link between the European commercial houses and the natives. But in spite of the prestige which the country of their origin, their strength of character,

and their fine physique gives them with the natives, they are unable to compete with the Chinese ; they prefer therefore to settle in remote places to trade, and seldom grow rich. They generally lack capital, and frequently contract bad debts ; many of them are merciless usurers, although usury is forbidden by their religion, and they are frequently dishonest in their dealings with Europeans. Shipping, which used to be largely in Arab hands, received a severe blow with the development of steam, as their goods were carried entirely in sailing ships : their trade consists now in journeys to Singapore, and along the coasts of the islands. They also work as fishermen and as carriage-jobbers, and in Palembang there are a number of Arab solicitors.

Wherever a sufficient number of Arabs are found the Dutch Government assigns them special quarters, divided into colonies of fifty with a captain in charge. Their houses are usually dirty and uncomfortable. Their clothing consists of a long white shirt with a jacket or unbuttoned coat over it, with sandals and a round cap or turban. Better-class Arabs often wear European trousers, shoes, and stockings, particularly in Bali, and some have adopted modern Turkish dress.

Arabs come to the Indies to make money, not to spread their religion : relations between the Arab and the native priests and *hajjis* are not as a rule harmonious. Though the Arabs avoid Christians, this is rather because, unlike the Chinese, they have no leanings towards Western education and ideas, than from any feelings of fanaticism. They realize, however, their dependence on the goodwill of the Dutch, and are loyal subjects of the Government.

HINDUS

In spite of their great past in the archipelago, Hindus—people from Bengal, Afghanistan, Malabar, and Coromandel—do not play a large part in its life to-day, and the older Hindu families, those who have spent perhaps half a century in the islands, have been largely absorbed by the natives amongst whom they live. They are nearly all drawn from the lowest classes, and leave Singapore, where work is more difficult to obtain and wages are lower, for Netherlands India. There are only a few thousand in Java, owing to its already crowded

condition, but in the Outer Possessions there are some 20,000, chiefly in East Sumatra, where they work as coolies, hawkers, barbers, &c., and are often employed as police. Many of the better-educated work as clerks. They are Mohammedans, and usually marry women of their own race. Their emigration to Deli is not authorized by the British Government, but many arrive there independently each year from India.

LANGUAGES

The different peoples of the East Indian islands have had in the past little opportunity and little need for inter-communication, and have never been united under one central authority : hence the rise of an innumerable complexity of languages and dialects in the archipelago. All these languages, however, are related, and belong to the Malayo-Polynesian family, which includes the tongues of the East Indies, New Guinea, and Polynesia, and probably took its rise originally in Annam, Cambodia, or Cochin-China. The Polynesian languages and those of the Philippine Islands form two distinct divisions in the group, but it is impossible, as yet, to group the many East Indian languages according to their degree of relationship.

Before the incredible wealth of tongues in their East Indian possessions the Dutch felt the need of an official language ; the use of Dutch by the natives was discouraged during the eighteenth and nineteenth centuries with the idea of increasing Dutch prestige, so Malay became the *lingua franca*. It was chosen rather than Javanese, which is the native tongue of a far larger number of people, because it is a simple and widely-diffused tongue, easily assimilating elements from other languages, whilst Javanese is extraordinarily complicated, and its use has never spread outside those whose mother-tongue it is. A knowledge of 'low' Malay (as distinct from true Malay, which is a refined and ceremonious language, and is used by those who wish to acquire prestige among the native notables) may be acquired in a few months ; it is used in the Malay Peninsula, the East Indies, the southern Philippines, Indo-China, and by the Chinese in their ports on the Chinese Sea and in the archipelago, and its knowledge is obligatory on all Dutch officials. All reports, prospectuses, and official announcements are issued in Malay, and it is taught in all the

schools. In fact, whilst Dutch is only spoken by the colonists themselves, and may be replaced by French or English, a knowledge of Malay is necessary to any one having any dealings with natives or Oriental immigrants in the East Indies.

RELIGIONS

Mohammedanism

The great majority of the peoples of Netherlands India are Mohammedans, the total being given in 1905 as 35,000,000, of whom 30,000,000 lived in Java : they thus form three-quarters of the entire population. The East Indian Mohammedans are not as a rule at all orthodox or devout Mussulmans, since they preserve a large admixture of the superstitious beliefs of their old animistic religions. The uneducated natives have only a vague knowledge of the dogmas of Islam ; they continue to serve their old gods, disguised as Mohammedan saints, and to ascertain their wishes by their ancient magic and placate them with charms : the spirits of the forefathers and the demons of the woods and streams have still a greater influence in Javanese life than Allah and his prophet, and the Mohammedan law, in its relations to marriage customs, inheritance, and family life in general, has more effect on the community than Mohammedan religious beliefs. The whole strength of Islam in the East Indies lies in the social distinctions and privileges which it confers, and the extent to which it rules the communal life of its adherents. In many of the less developed islands religion is a more important social division than race : he who becomes a Mohammedan is counted as a ' Malay ', a member of the superior class. There is no real Mohammedan propaganda ; its converts are won by indirect means. Conversion is by no means always an upwards step, as far as cultural development is concerned, since the heathen peoples are frequently in advance of the Mohammedan in moral character, in their treatment of women, and in industry and craftsmanship ; but Islam brings a widening of the horizon, an increase of self-esteem, and a position in a widely-diffused and constantly spreading religious and social system. The continuous spread of Mohammedanism in late years is due partly to the large number of cheap Arabic books circulated among the increasing number of natives who can read the language, and partly to the continuous penetration of Moham-

medans—Arabs and Malays—among hitherto pagan peoples. These settlers intermarry with the natives, and introduce their religion and their customs among them, so that in this sense each Mohammedan is a missionary. The Dutch administration is also always compelled to make use of the more civilized and Islamized natives as official go-betweens with the undeveloped peoples, thus creating a prestige for Mohammedanism from the start.

In 1913 there were 17,655 pilgrims to Mecca from Java, 5,318 from Sumatra, 1,485 from Borneo, and 629 from Celebes. Except in the case of Java, the numbers were smaller in 1914, probably owing to war conditions during the second half of the year.

Christianity

Christianity is in quite a different position from Mohammedanism, since it is the religion of the white population, and no conversion from paganism to Christianity can give a native a place in European society ; it can thus never play so important and comprehensive a part in the social development of the native as Mohammedanism. Its efforts at proselytizing and improving the natives are more premeditated and arranged, working through the Christian missions and through the gradual bringing of law, politics, and taxation into line with European customs. Western ideas and habits are constantly filtering into native communities, along with Western education, clothing, and household goods, and gradually change the conditions of their life. The Dutch Government, however, has always strongly discouraged the bringing of any direct pressure to bear on the native to change his religion, and forbids the wearing of European clothes, the first desire of every native convert. In 1914 there were about 48,000 Protestant Europeans and 660,000 natives in the Netherlands Indies, with 31,000 Roman Catholic Europeans and 52,000 natives : the Christians thus still form only some 2 per cent. of the total population, and though their numbers have advanced considerably of late years, they are still small as compared with those of the Mohammedans and pagans. The chief Christian Church is the State Dutch Protestant Church, to which most of the Protestant Europeans belong, and some 330,000 natives. It had 41 pastors in 1914, with a smaller number of assistant pastors, who are in charge of some of the missionary churches

which have been incorporated in the State Church. There are also small Free Reformed Churches in Batavia and Surabaya, and an English and an American Church in Batavia.

During the nineteenth century mission work was widely extended by private enterprise. Success was varied, and it has been found easier to get converts among the pagan peoples, where Mohammedanism could be forestalled, than among the Mohammedan peoples, where the work is difficult and laborious, though the Dutch missions are said to have made about 35,000 converts, and to be more successful among Mohammedans than those of any other country. Minahassa was found the most fertile field for missionary activity, practically the whole population being converted to Christianity, and in Amboina, where mission work was most widespread in the days of the Company, the people were found to be still largely Christian, in spite of the long period during which they had been neglected. Of late years Christianity has made most headway in the Moluccas and New Guinea, where Mohammedanism is more or less at a standstill. Missions in the Netherlands Indies have suffered as usual from a lack of unity, but in 1906 all the different Protestant missionary bodies combined to establish a missionary consul at Batavia to represent mission work in general, and in its relations with the Government in particular. The Protestant missionary associations, which had 349 missionaries in 1915 (exclusive of some 30 Salvation Army workers), have about 294,000 converts and possess a number of lower industrial schools, hospitals, training schools for native teachers and preachers, &c. In addition to the various Dutch missions, there are a number of German missions, and the Rheinische Missions Gesellschaft has been very successful in the Batak country in Sumatra, having about 100,000 converts. In addition there are small missions of the Seventh Day Adventists, the Methodist Episcopalians, &c.

The majority of the Roman Catholic natives live in Menado, Amboina, and Timor, and there are now some 2,000 in West Borneo, where there was no resident missionary of any denomination till 1905: it has now been placed in the care of the Capuchin Fathers, and has been made an Apostolic Prefecture, as distinct from the Vicariate of Batavia, but neither Christians nor Mohammedans have made much progress in Borneo in recent years. The Roman Catholic Missions have won a

favourable position for themselves in the East Indies : the churches are well attended, and the priests are respected everywhere.

Confucianism

The Chinese, with the exception of some 1,300 Christians, who are increasing in number, and about 300 who are Mohammedans, are Confucians.

EDUCATION

Native Education

Up to about 1850 government concern for native education was limited to the native Christians in the Moluccas, but the necessity for a larger supply of native officials possessing a certain amount of education induced the Government to start some twenty schools in which the sons of the native aristocracy were trained. Before many years had passed public opinion began to realize the duty of bringing education and development within the reach of all natives, irrespective of whether they were to become servants of the administration or not, but it was not till 1872 that a general scheme for native education was set on foot. This first scheme was not very successful, since the education given was of too advanced a character, and the system organized on too large a scale. The present system was therefore brought into being in 1893, when it was realized that though it was necessary to provide schools giving a fairly elaborate education in the towns and industrial centres, an extremely simple curriculum was ample for the lower-class natives all over the archipelago.

The native schools of the East Indies are divided into State Schools and Private Schools, the majority of which are in the hands of missionaries. The numbers of different kinds of schools, and the numbers of pupils are given for the year 1914 in the following table :

	GOVERNMENT SCHOOLS.			PRIVATE SCHOOLS.		Total number of boys attending school.	Total number of girls attending school.	Total number of schools.	Total number of pupils.
	1st class.	2nd class.	People's schools.	Non-religious.	Religious.				
Java and Madura	83	749	3,251	340	161	377,325	30,098	4,854	407,423.
Outer Possessions	12	417	697	371	1,677	175,843	40,933	3,174	216,776

Government Schools.—State schools are divided into those managed directly by the administration, and those originated by, and under the management of, native communities ('peoples' schools') subsidized and supervised by the Government: all these schools are non-religious. The schools administered by the Government are again divided into 'Dutch native schools', first-class schools (in which a comparatively extensive education is given, and Dutch taught), intended for the better-class natives, and second-class schools, limited since the provision of peoples' schools to those places where the need is felt of a somewhat more elaborate curriculum for the lower-class native children than is provided by the 'peoples' schools'. In these latter schools the education consists in the reading and writing of the language of the country or of Malay, and a knowledge of the four chief rules of arithmetic, with the possible addition of one or two subjects taught in the Dutch native schools: the school hours are $2\frac{1}{2}$ each day. Dutch itself is taught only in the first-class schools, in response to the growing wish of the more educated natives that their children should acquire the language of the ruling class. The aim of the Government in the case of the 'peoples' schools', which have all been established since 1907, is to make them as far as possible self-supporting, and only to assist in their establishment where a genuine wish for education is felt: the people themselves provide the buildings, while the Government supplies the fittings. The teachers are chosen as far as possible from amongst those who have been educated in a second-class school, and have then had practical experience as teachers, or from young men who have gained a diploma as pupil-teachers.

Private Schools.—It will be observed from the table above that there are many more government and peoples' schools in Java than there are private schools, and there are only 161 schools in the hands of the missionaries. In the Outer Possessions, however, where the missionaries have their chief sphere, and where they exercise their influence largely by means of the education which they give, there are only 1,127 government schools, as against 12,040 in private hands, 1,677 of them on a religious basis.

Education of Girls.—It will also be noticed that while the total number of girls attending school is much smaller than the total number of boys, the proportion of girls to boys is much

higher in the Outer Possessions than in Java. This is due to the strong prejudice in a highly Islamized country like Java against the co-education of the sexes: there is a growing demand for female education, but at present no native schools for girls only are provided.

Mohammedan Schools.—In addition to the schools giving a Western education, there are a large number of Mohammedan schools (16,857 in 1914) giving instruction in the principles of Islam and in the reading of the Koran, to which the natives are allowed and even encouraged by the Dutch to send their children.

Native Teachers.—The native teachers in the government native schools are trained and examined in the government training schools, of which there are seven in Java, one in Makassar, one in Amboina, and one in Sumatra, and the schools are periodically inspected. The teachers in the private schools are often untrained, and are not visited by the government inspectors, but there are a number of private training schools for missionary teachers, which are subsidized by the Government. There were 4,752 teachers and pupil-teachers in the 1,261 first- and second-class government schools in 1914.

European Education

Primary Schools.—Primary European schools are established wherever the needs of the population render it necessary, and are divided into mixed and girls' schools. Fees are paid by those who can afford them; native children cannot as a rule enter these schools free, but may do so on payment of fees, provided they have a knowledge of Dutch, and a certain number—who intend to become native doctors and officials—are educated in the European schools free. The schools are non-religious, but religious teachers are allowed to attend to instruct the children. The primary schools are largely preparatory for the secondary schools. About half the children receive a free education, and there are very few European children not attending school: the staff, particularly the male staff, is drawn largely from Holland, but a number of women teachers are trained at Batavia. In 1913 there were 159 primary schools in Java (19 for girls only), and 51 in the Outer Possessions (3 for girls only).

In addition to the above schools, there are the Dutch Chinese schools, set up by the Government when the wish for education on a Western basis had been proved by the large number of schools founded by the Chinese in the archipelago since 1900, and modelled on Japanese lines. These Dutch Chinese schools are also open to Europeans, and occasionally natives are admitted: the children are taught by Europeans through the medium of Dutch, and the payment of fees is obligatory.

Private Schools.—There were 32 private schools in Java in 1913, almost entirely on a religious basis, and largely Roman Catholic girls' schools which have been started by those who disapprove of the non-religious government schools: these are mostly subsidized by the Government.

Secondary Education.—There are 15 establishments giving secondary education in Java. They are open to all with no race distinctions, and had a total number of 2,360 pupils in 1913, 492 of them being non-Europeans. They include the *Hoogere Burgerscholen* at Batavia, Surabaya, and Semarang, with a five-years' course; one, the Queen Wilhelmina School, at Batavia, with a three-years' course; and four for girls at Weltevreden, Batavia, and Surabaya.

THE PRESS

The official newspaper of Netherlands India is the *Javasche Courant*, published twice weekly by the Director of Government Industries. Besides containing official announcements it is also a government organ for news. There are, besides, numerous private publications, 54 of which come out yearly, 32 monthly, 19 twice a month, 25 weekly, besides 20 daily papers and several others published at varying intervals. There are, moreover, 57 publications in the Malay or Javanese language.

Among the more important newspapers are the *Java Bode*, *Het Bataviasch Nieuwsblad*, and *Het Nieuws van den dag voor Nederlandsch Indië*. These papers are all published in Batavia. At Surabaya are the *Soerabaja Handelsblad*, the *Nieuwe Soerabaja Courant*, the *Soerabaiasch Nieuwsblad*, and *Het Weeksblad voor Indie*. The *Locomotief* is the principal paper at Semarang. In Sumatra are the *Deli Post*, the *Deli Courant*, the *Sumatra Post*, and the *Sumatra Bode*; the *Nieuws en Advertentieblad voor de residentien Palembang, Djambi, en Banka*, published at

Palembang, is issued solely in the interests of the petroleum industry. A similar paper has been started in Kota Raja in Aceh. The Makassar newspaper is the *Makassarsche Courant*, and at Banjarmasin is published the *Banjermassingsch Nieuwsblad*. Most of these newspapers are said to be neutral in politics inasmuch as they do not consistently support any particular faction. This neutrality apparently does not preclude criticism of particular officials or their measures. Among journals run exclusively in the interests of a party are the *Stem van Indie*, the organ of a society of people born in the colonies, and the *Jong Indie*. Both Roman Catholics and Protestants publish their own periodical. The *Utusan Hindia* is the chief organ of the Mohammedan League. The *Java Times*, printed in English, is chiefly devoted to the needs of tourists.

Besides the organs of the large towns there are various provincial papers such as the *Midden-Java* of Jokyakarta, the *Oesthoek* of Probolinggo, the *Oprechte Buitenzorger* of Buitenzorg, the *Jahns Advertentieblad* of Malang, and several others.

Of papers printed in the Malay language the *Keban Perhiasan* of Batavia, the organ of the modern Chinese and Javanese party, is said to be the most widely read journal in Java. It is edited by a Javanese assisted by a Chinaman, and apparently, like several other Malay papers, it is against the Government in policy. There are, besides, many other papers printed in the vernacular which are either non-political in character or favourable to the Dutch colonial régime.

Up to 1906 there were in vogue in Netherlands India legislative restrictions which have been described in the States-General as the 'work of darkness', and are generally agreed to have been harsh. Briefly, they aimed at preventive control, with heavy punishments for their infringement. Six Dutch journalists have been banished, although this penalty has not been inflicted since 1873. In 1906 the regulations were modified, chiefly in the respect that the censorship of publications takes place after instead of before they have been printed. The responsibility for publishing libellous or seditious matter now devolves upon the authors and printers. Punishments inflicted include imprisonment and fine, besides suppression and confiscation. There are special regulations aimed against the introduction from Egypt and Turkey of fanatical Mohammedan publications.

HEALTH

Diseases

There is a high incidence of diseases of many sorts in most of the islands of the East Indies, and Dutch authorities admit that conditions are unfavourable, in spite of the efforts made to combat epidemics by quarantine regulations, the extended use of the Civil Health Service, notification of infectious disease, free vaccination and provision of quinine, &c. The native death-rate was about 20 per thousand in Java in 1914, which showed a decrease on that of 1913, but it is higher in the big towns, e. g. 63 per thousand in Batavia, and 47 per thousand in Surabaya. Among the coolies in the Lampong districts, Sumatra, it rose to 90 per thousand in 1914, owing to epidemics of dysentery and hook-worm disease. The European death-rate in the larger towns of the archipelago averaged 15 per thousand in 1914, malaria and typhus having the highest death-figures of any single disease.

Malaria.—The most common disease in the East Indies is malaria : it attacks large numbers of Europeans and natives alike, and is prevalent in all its forms, though the recurrent form is most common. It is always endemic, occasionally breaking out in epidemic form : the incidence and death-rate vary much, but the death-rate is usually low. In spite of the efforts made to fight it by the free distribution of quinine, the improvement of drainage, the destruction of mosquito larvae, and the enforced cleanliness of gardens and yards, there were a very large number of cases in Java in 1914. As an example, in the Wonoaju and Ponokowan sub-division, with a population of 465,000, there were 66,015 cases of malaria, with 3,909 deaths, and the fever is equally prevalent in other parts of the archipelago. Blackwater fever in 1914 only occurred in Siboga (Sumatra), where there were 22 cases.

Plague.—Though in the past the East Indies have been practically free from plague, in 1914 there were 15,275 cases recorded in Java, with 13,522 deaths, chiefly in Pasuruan, Kediri, and Surabaya. In order to avoid a wholesale evacuation of the population, a beginning was made with the fumigation, inspection, and improvement of the native houses, and a special service to combat the disease was instituted in 1915.

Cholera.—Cholera is endemic in most parts of the archipelago,

and sometimes epidemic, 4,328 cases being reported in 1914. Many people have comparatively slight attacks, and it is difficult to detect any reason either for the start of an epidemic or for its cessation. Prophylaxis by inoculation and hygienic precautions have given satisfactory results.

Small-pox.—Small-pox is sporadic, and occasionally epidemic, but is much less common since the institution of vaccination. There were, however, considerable outbreaks in 1914 in Batavia (2,416 cases) and Preanger Residency (1,064 cases) in Java, and in Borneo (4,120 cases). In 27 divisions in Java, vaccination and re-vaccination are compulsory, and in the rest of the island vaccination is enforced on the occurrence of cases of the disease. There is apparently little difficulty in inducing the native population to submit to vaccination in the Outer Possessions, where epidemics of small-pox have been exceedingly violent in the past in many parts. In Java in 1914 936,510 people and in the Outer Possessions 237,174, were vaccinated.

Beri-beri.—Beri-beri rarely occurs as an epidemic among natives living a normal life, but is very common among coolies in mines or on plantations, in the army, in prisons and orphanages, &c., and it is a danger for explorers employing parties of native bearers. It has increased in the last half-century.

Dysentery.—Dysentery has become less common in the last half-century. The earlier form, which was probably bacillary, and had a high death-rate, has been quiescent for a long period, though cases have again been noticed lately. Amoebic dysentery, however, is common, and sometimes assumes an epidemic form.

Leprosy.—There were 2,845 lepers in the East Indies in 1905, including 65 Europeans and 743 Chinese. The number of lepers' hospitals is increasing.

Other Diseases.—Typhus rarely occurs in epidemic form: 158 cases were reported in 1914. Tuberculosis attacks the natives in many places. Hookworm-disease (*ankylostomiasis*) is common among coolies, particularly in the Lampong districts. Measles and whooping-cough are not important, since they take a milder form than in Europe: there were, however, 60 deaths in a measles epidemic in one of the islands of the Riouw Archipelago in 1914. There are occasional local epidemics of eye diseases, particularly *conjunctivitis*. Influenza is common. Diphtheria is sporadic, but epidemics are rare. Skin diseases

are very common among the less developed peoples. Cerebro-spinal meningitis is sporadic.

Insanity.—There were 9,157 insane people in Java in 1905, and 6,479 in the Outer Possessions; 2,470 were under treatment in the two large Javanese asylums in 1914. Insanity in natives, among whom there is little hereditary tendency to lunacy, is often caused by fever or by syphilis: alcohol, the use of which is rare, and opium (except in the case of running amok) are not predisposing causes. The use of opium has become more common of late years, but there is reason to suppose that many cases of running amok are subterfuges to cover private revenge.

Health Service.—The Civil Health Service of the East Indies exists to combat and prevent epidemics, to advance medical treatment on European lines, to control the use of medicines and consumption of unsound or unsuitable food, to look after lunatics, to care for government employees, and to give free medical, surgical, and obstetrical aid. For purposes of administration Java is divided into three medical districts, and in the Outer Possessions the divisions coincide with the military health districts.

The chief means by which it is endeavoured to combat epidemics is by the quarantine system at the chief harbours, which is applied to yellow fever, small-pox, cholera, and plague. There are also special regulations for the Mecca pilgrims, who may only depart from, and arrive at, certain ports. In the second place, it is intended to prevent the occurrence of epidemics by keeping careful watch on the amount of sickness in any place, and by the improvement of the water-supply, the boring of artesian wells, and the laying down of mains. Efforts are also made for the betterment of the sanitary conditions, though considerable difficulty is experienced in inducing the natives to pay any attention to hygiene. The Mohammedan religious laws, such as those prohibiting the use of certain foods and of alcohol, and the pollution of rivers, and inculcating the necessity of ceremonial washings, are hygienic in their aim, but unfortunately they are not carried out with any degree of strictness. The common habit of keeping the cattle under the houses is highly insanitary, and is condemned by the Dutch, and in many parts the houses and persons of the natives are extraordinarily dirty. In Java certain unhealthy articles of food and drink are forbidden, disobedience being a punishable

offence : the defilement of rivers and the making of fresh ponds is forbidden. In the case of epidemics, cases must be isolated and notified, and the place where the outbreak occurs is visited by an inspector of the Health Department, to note conditions, and have an analysis of the disease in question made at the Weltevreden laboratory. In addition to the government hospitals, and the numerous polyclinics, the Civil Medical Service encourages private enterprise by means of subsidies, or grants of land, and in 1914 there were 131 private hospitals, sanatoria, and similar institutions. It aims at the establishment of the medical care of the natives on a European system, and with that object it trains natives in Western ideas concerning health and disease, and founds hospitals and polyclinics. There are schools at Batavia and Surabaya for the training of doctors for work in the Indies, one for natives only, and in 1914 there were 135 European doctors practising privately, 83 in government, and 60 in army employment, and 187 native doctors. In 1914 there were 66 European midwives, all but two of them working in Java, and 77 native midwives, of whom 59 were employed by Government, and 47 practised in the Outer Possessions. In addition to the 5 general hospitals of Java, the 11 military hospitals, where civilians are also admitted, and the 134 native hospitals, there are special institutions for the cure of eye-diseases, beri-beri, and leprosy, and a Pasteur Institute.

In contrast to this care for the natives, hospital treatment for Europeans is almost non-existent : a few cases are taken in at the General and Military Hospitals, but these institutions are primarily intended for natives. Government officials receive free medical treatment.

CHAPTER VI

THE INHABITANTS OF JAVA

Numbers—Density of population—Urban and rural population—Migration and increase—Native peoples—Javanese (Physical characters—Culture—Religion—Pastimes—Position of women—Occupations—Villages and houses—Clothing)—Sundanese—Madurese—Tenggerese—Baduj—Kalangs.

NUMBERS

THE total population of Java, Madura, and the dependent islands was given as 36,035,435 in 1912, and consisted of 35,577,660 natives, 86,681 Europeans, and 351,094 foreign Orientals, largely Chinese. Thus the natives formed about 98 per cent. of the total population; the Chinese have been slowly decreasing, and the Europeans increasing in numbers since about 1870.

DENSITY OF POPULATION

The causes of the very thickly populated condition of Java, as compared with the other islands of the archipelago, have been discussed in Chap. I (p. 16). The residency of Kedu is one of the most densely inhabited districts in the world, but owing to the comparatively thinly peopled condition of the western and eastern ends of the island, the average density for the whole of Java is a little lower than that for England and Wales. The flat country and the hills, with the exception of the marshy stretches, are the most thickly populated. The mountain country has fewer inhabitants, but the Preanger plateau is an exception, and the development of coffee, tea, and cinchona cultivation at high altitudes has had the effect of bringing many people to live at a considerable elevation. The number of inhabitants is also connected with the percentage of ground under cultivation. Thus the most thickly populated region in the centre of Java, which includes Surabaya, Kedu, and Jokyakarta, is also the part where most land has been cleared, and the reverse is the case in the thinly populated districts of Bantam, Preanger, Besuki, &c. The population

on the north coast is both thicker and more generally distributed than on the comparatively inaccessible and mountainous south coast, and is of a mixed character, owing to the number of Malays, Chinese, and Arabs who have settled there, while the dwellers on the south coast have preserved their peculiar characteristics more exclusively.

URBAN AND RURAL POPULATION

The majority of the towns are on the north coast, where the trade of the island is largely concentrated: there are no capitals of residencies on the south coast, and those which are not on the north coast lie mostly in the centre of Java. The towns are thus situated in the most thickly populated and highly cultivated part of the country, and there are no divisional capitals in the thinly populated parts, such as South Bantam and the Preanger Regency. Owing, however, to the prevalence of agriculture, only about three per cent. of the population are concentrated in the towns, of which in 1905 there were only twenty containing a population of more than 20,000; two of them having over 100,000, as follows: Batavia (138,551 in 1915), Meester Cornelis (33,989), and Buitenzorg (33,401) in Batavia; Bandung (47,491), in the Preanger and Regencies; Cheribon (23,540) in Cheribon; Pekalongan (41,719), Pemalang (20,920), and Tegal (32,344) in Pekalongan; Semarang (96,660) and Kudus (27,502) in Semarang; Tuban (24,536) in Rembang; Surabaya (156,752 in 1915) and Grisee (26,467) in Surabaya; Pasuruan (28,534) and Malang (29,541) in Pasuruan Residency; Magelang (28,241) in Kedu; Jokya-karta (79,567) in Jokyakarta; Surakarta (18,378) in Surakarta Residency; Madiun (22,814) in Madiun Residency; and Kediri (40,205) in Kediri Residency. Even in these towns a proportion varying from a tenth to a quarter consists of foreigners, and the prosperity or adversity of any region thus depend far more on the quality and quantity of the land cultivated than on any other consideration.

MIGRATION AND INCREASE

It should be possible to encourage emigration among the Javanese, in spite of their attachment to their own land, since they have shown an encouraging readiness to go and work in

Acheh, the Ombilin mines of Sumatra, or Pacific islands, and considerable movement from one part of Java to another has taken place since about 1870. Alternatively it will be necessary to convince the native cultivator by counsel and example that it is in his own interests to improve his methods, and to increase the means of communication and irrigation, for the Javanese have not at present the means of increasing the products of the land, or the knowledge of intensive and extensive cultivation which will be necessary to provide for the needs of the coming generations, if the present rate of increase continues. In 1905 there were 565 people to the square mile in Java and Madura, and the native population doubled itself between 1865 and 1900. This very rapid increase is partly, no doubt, due to the early age at which marriage is celebrated among the Javanese, usually when the girl is twelve or thirteen, and the man fifteen or sixteen. As in Europe, more boys than girls are born, but more girls reach maturity.

NATIVE PEOPLES

As distinct from the strangers, European and Oriental, the population of Java consists of three chief races—the Javanese, Sundanese, and Madurese, who all came originally from the same Malay stock. They differ now, however, to a considerable degree, though it must always be borne in mind that the differences in the form and character of individuals are so infinite that it is not possible to draw a distinct or accurate line of delimitation between any two races. The difference in character between the Sundanese and the Javanese is to be explained by the stronger influence exercised over the latter by the Hindus; and the difference between the Javanese and the Madurese is due to the fact that the Madurese, who have now settled in a large part of Eastern Java, were confined for a long period to the island of Madura, where they earned a difficult living by trading and fishing, while the Javanese have always been primarily agriculturists.

The frontier between Central Java and the Sundanese country is formed by the Tanduwi and Losari Rivers; and the Sundanese country thus consists of the residencies of Bantam, Batavia, Cheribon, and the Preanger Regency. The Madurese live in the islands of Madura, Kangean, and Bawean, and also in the

eastern part of Java. The first Madurese villages are found in Malang and Pasuruan, and become more numerous towards the north. The Madurese form almost the whole of the population of the Grati and Jati districts of Pasuruan, the Tengger district (except in the mountains where the indigenous Tenggerese live) the Probolinggo residency, and the Besuki residency (except in the south and in Banyuwangi). Bangil is the most westerly point of Madurese settlement, and the population of the whole of central Java, i.e. Pekalongan, Banyumas, Kedu, Semarang, Surakarta, Jokyakarta, Rembang, Madiun, Kediri. and Surabaya is almost entirely Javanese. The Sundanese are said to number about five million and the Madurese rather more, so that the Javanese are by far the most numerous, and occupy a larger extent of territory than the other two peoples.

Physical Characters

All three peoples have the light brown skin, dark brown or black eyes, and smooth black hair of the Malay race ; curly hair denotes a foreign strain. The colour of the skin is usually lighter among the aristocracy, and among the Javanese some natives—particularly those living in the mountains—are of a considerably darker tint, while the skin of others is almost golden in colour. The eyes are set nearly horizontally, the mouth is large as among all Malay peoples, and the lips thick but well modelled. The nose is not so flat as among the Sundanese, and is sometimes aquiline in shape, and the features are in general marked and expressive. A small moustache is usually worn by the men. The Javanese are taller than the Sundanese, averaging 5 ft. to 5 ft. 6 in., but they are of slender build.

JAVANESE

Culture

The Javanese are not only the most numerous of the races inhabiting Java, but also the most civilized, and this civilization is comparatively highly developed. The influence of Hinduism was much stronger and more enduring in the Javanese districts than in the Sundanese and Madurese country. Mohammedanism quickly made converts through the influence of the Arab traders on the north coast and in Madura, but extended its conquests much more slowly in the centre of Java, where

Hinduism had its strongholds. Even after Mohammedanism was officially embraced by the people, there were many relics left of the old religion : the Javanese script and folk-lore are Hindu in origin, and many of the customs and beliefs of the natives date from pre-Hindu pagan times.

Language and Literature.—The original language of Java was what is now called Old Javanese or Kavi, and differed considerably from modern Javanese, so that it is not understood by the natives of Java at the present day, though a knowledge of the ancient tongue has been conserved by the people of Bali. Middle or Cheribon Javanese, the language of the old kingdom of Majapahit, is still spoken by some three million Javanese living in Banyumas, North Cheribon, North Krawang, and North Bantam. The chief language of the Javanese, however, is new Javanese, but the difference between the two tongues is not so marked but that a man speaking Middle Javanese can understand one speaking New Javanese in one of the several forms which are in use in Central Java.

The Javanese language received a great impulse of development in the seventeenth century, but its literary development was a continuation of the earlier speech and writing of the courts of Kediri and Majapahit, when, under the influence of the new Mohammedan religion, an amazing literature was produced, and Javanese poets set themselves to reproduce works of Hindu culture such as the Mahabharata and the Ramayana in their own tongue. These works are mainly mythological and romantic, and date from the eleventh and twelfth centuries of our era ; Javanese thus became the most important language of the archipelago, and the literature of the Malays, the Buginese, and the Makassarese is not to be compared with that of Java. To the Mohammedan period which succeeded to the Hindu belong the *babad*s, or semi-historical poems written round the various rulers of the Hindu period. This literature, however, is mainly that of the past ; for several centuries national life has been directed by alien forces, and little has been added in modern times to the Javanese literary inheritance. Among modern works are a number of romances, and also treatises translated from the Arabic. Works written in Kavi have been translated into modern Javanese, and the people are acquainted with these versions by the representations of the theatre (the *wayang*) where plays called *Panjis*,

tales from the life of Panji, the national hero of Java, are given.

Though it is probable that the Javanese language and literature had reached a fair stage of development even before the Hindu immigration, it has been deeply influenced by foreign elements, particularly by Sanskrit. The Arabic tongue has also left its mark on Javanese through the Mohammedan conquest, though in a much smaller degree, and Javanese has itself had a marked effect on Sundanese and Madurese. Its characteristic feature is its wealth of words and letters, and the numerous groups of terms descriptive of a single thought. There are, for instance, in Javanese separate words for carrying on the head, on the shoulder, on the arm, on the back, in the hand, &c., but there is no word to express the simple idea of carrying. There are also a very large number of terms descriptive of degrees of rank, in consonance with the complicated social system of Java, and the right use of these terms is considered very important, so that many officials who speak Javanese easily make a practice of addressing native chiefs in Malay, for fear of giving offence by using the wrong title.

Modern Javanese is divided into two chief forms of speech and several subsidiary forms. The common language of Javanese thought is called *Ngoko* : it is used by the common people among themselves, by their superiors when addressing them, and also by children. *Krama*, which contains a number of Sanskrit words, is used by people speaking to their superiors, and also by people of rank among themselves, unless some other form is dictated by their relationship and relative positions. It is the form of the language which is used in writing. *Madya*, a mixture of *Ngoko* and *Krama*, is used by people who are not officials and are of equal rank, when *Krama* is too servile, and also by a superior to an inferior who is older than himself and whom he wishes to honour. It is employed also between buyers and sellers of goods. *Madya* and *Krama* are both used in the villages, and there are innumerable nuances between these forms of speech. *Basa Kedaton* is the speech of the Court, and is used except when speaking to or of the sovereign. He himself uses *Ngoko*, or *Krama Inggil* when speaking of his own person, and *Krama* is used in addressing him, his first wife, his daughters and the Crown Prince. The ladies of the Court speak *Krama* among themselves, and

Basa Kedaton to the men. *Krama inggil* consists of some 300 words used in speaking of God, or of some highly-placed and honoured person. *Bada Kasar* or *Ngoko andap* is a rude and impolite way of speaking in which words usually used of animals are applied to men.

Mental Character.—The salient fact in the formation of the typical Javanese character has been that the people have been always under the rule of strangers from the time when the Hindu colonists first set foot on the island to the present day. But although their mentality has been enfeebled by long servitude to foreign masters, they keep a proud memory of their past and a fine faculty for assimilation. They master the subtleties of their own language, and of the Malay tongue in addition, and are ready and eager for education. The native children learn to read and write very quickly, comparing favourably with European children in the schools. The men have a strong sense of direction and of orientation and a wide knowledge of the properties of trees and plants. The Javanese are, as a rule, reserved, gentle, and tractable. They are seldom angry, except when they are roused by jealousy, or by gaming and opium, when they are apt to run amok, and unwise treatment makes them revengeful. But they are hospitable and generous, devoted to their children, kind to old people, and charitable to the poor and the wrong-doer. They retain the exquisite politeness of men of high lineage, and the honour which they pay to those who are higher in position and rank than themselves often strikes Europeans as servile. A Javanese never stands when speaking to his betters, but sits cross-legged on the ground with his hands to his forehead, and when he meets his superior, or even passes his house, he will turn his back and squat down on the ground. Authority is everything to him, and he is equally ready to accord honour to others as to exact it for himself. The Hindu caste-system left a very strong mark on Javanese society, which is divided into nobles and commoners. The nobility which includes the higher officials, is still much honoured by the lower classes. The dream of every Javanese is to attain to an official position and to carry the umbrella (*payong*) which is the mark of a person of high rank. Hence there is never any difficulty in getting natives to fulfil the duties of the *desa* administration, which bring much work and little profit.

The Javanese are much attached to their own birth-place and the graves of their ancestors, and also to the *adat*, which consists of the customs and institutions in use among their forefathers, so that it is difficult to convince them of the superiority of any new method or invention. They have few needs, and are content with rice and dried fish or meat to eat, and coffee to drink, with tobacco and betel-nut. They have no need of strong drink, except where the nobles and princes have caught the habit from Europeans. They are devoted to games of chance of all kinds, and frequently gamble away their whole possessions. Since they are incapable of saving, it follows that when they are in possession of enough money to satisfy their needs, they have no incentive to work to get more, though they work hard enough when it is a question of earning a subsistence. This apathy is thus not due to any dislike of agricultural labour, for the Javanese is passionately attached to the soil, and a splendid agriculturist on his own lines ; but it may also be ascribed to the fact that for centuries he has never laboured for himself, but always for others. Since the Dutch have occupied themselves with the improvement of native life, however, there are signs that the Javanese are becoming desirous of saving money to procure new necessities and pleasures.

Religion

Except for the Baduj, the Tenggerese, and the twenty-six thousand or so of native Christians, the inhabitants of Java are Mohammedans, without having entirely given up their ancient Hindu and animistic faiths. Though they are somewhat lukewarm in the practice of their religion, a fair number (which is increasing owing to the improvement in the means of communication) make the pilgrimage to Mecca to gain the honour accorded to a *hajji*. They are very superstitious, and believe in spirits—the mountains, the woods, the rivers are all inhabited by good or bad spirits, and incense is burnt, amulets worn, and food offered to gain their goodwill. They pray to the *danjhang desa*, the protective spirit of the village, in front of a rude stone altar under the trees, to avert disaster and invite answers to questions, and each worshipper offers incense and a few flowers. Each *desa* also honours the soul of its founder, and each member of the *desa* his own ancestors : sacrificial

meals are offered on the third, seventh, fortieth, and hundredth day after the death of a relative, and once a year graves are decorated and offerings made. The crocodile and the tiger are also honoured, and traces of the belief that the souls of the dead come back to re-inhabit living bodies exist among the Javanese ; they communicate with spirits through the holy men called *ngelmu*. Many hermits and ascetics live in the wilderness and on the mountain-tops, and sometimes among their fellow-men.

Festivals.—The chief interest of Javanese native life consists in the festivals, which are partly connected with Mohammedanism and partly with the honouring of spirits, for whom the most delicate dishes are often set aside at these sacrificial feasts. But any event of importance is made the occasion in a Javanese household for such a feast, which begins with religious observances and is accompanied by music, acting and dancing. The quantity and quality of food and its preparation on each separate occasion is regulated by the *adat*, which is quite separate from Mohammedan law, and often opposed to it. Thus, although the Javanese have few set holidays, they are always spending their time and money in festivities. Weddings in particular are made the occasion of much rejoicing and a great display of magnificent garments.

Pastimes

The Javanese are exceedingly fond of their native theatre (*wayang*) and of music and dancing. Javanese music has reached a high state of development, and the native orchestras (*gamelan*) perform at religious ceremonies and gatherings of every description. These orchestras consist largely of slips of wood or metal, which are struck with hammers, and of gongs, but they also contain stringed instruments, flutes, and drums ; they have been established at the Court of Jokyakarta in particular for a very long period, and the players have reached a standard of considerable skill. Javanese dancing consists of a series of twistings and posturings of the body and limbs, the feet being only slightly moved. The *wayang* consists of shadow-plays with wooden puppets, though sometimes the puppets themselves are shown, and sometimes their place is taken by men. But Javanese civilization shows less development in these directions than in that of literature.

Among the habitual pleasures of the Javanese betel-nut chewing and tobacco-smoking are universal, and opium-smoking has become more and more common of late years.

Position of Women

Only the officials and notables can, as a rule, afford to have more than one wife (though polygamy is sanctioned by Mohammedanism), and they also are tending to monogamy in imitation of Europeans, so that various motives are combining to raise the status of Javanese women. Moreover, the matriarchate was for a long time the basis of Malayan society, the influence of the *adat* has always fought against that of Hinduism and Mohammedanism in this matter, and the morale and position of women has always been comparatively high in the archipelago. A Javanese woman goes unveiled, shares her husband's interests, and has her place at the festivals.

Occupations

Agriculture, as has been seen, is the chief occupation of the Javanese, and the cultivation of rice in particular, for rice forms their principal food. Many of the inhabitants of the north coast live by fishing. There are about 270,000 craftsmen among them, and the industries arising from the principal crops, (the preparation of tobacco, tea, coffee, &c.) have made great progress since the institution of the free labour system, though native industries such as weaving, have decreased in importance owing to the European import trade. The native craftsmen, who are often clever workers, sell their products—*batik* cloth, garments, hats, shoes—for European use, and are employed by the Government on constructing lines of communication and buildings. But native manufacturing undertakings are few and unimportant, and the hard-working and competent Chinese stand in the way of any wide employment of the natives as artisans and in business. The Javanese traders are mostly occupied with third-hand retail trade—the native hawkers buy goods from the Chinese middlemen on credit, and sell them in the *desas*, and in the markets which are more or less inaccessible to Europeans, or foreign Oriental traders. The Bawean and the Kudus in particular trade all over the island, and compete successfully with the Chinese dealer, especially in the Oost Hoek. (Further details will be found in Chaps. IX, X.)

Villages and Houses

As the Javanese are chiefly engaged in agriculture, the majority live in villages (*kampongs* or *desas*) of 300 to 500 inhabitants. When they live in towns they usually occupy a separate native quarter. The Javanese house and its appointments are very simple in character; the floor is of beaten earth, and wooden or bamboo posts carry a roof of *atap* (*nipa* leaves or *alang-alang*), or of wood. The ridge-pole is often turned up sharply at the ends and the walls are of bamboo. A structure called *pendopo*, in which visitors are received and feasts given, is often added. The houses have no windows, and only sometimes square holes in the walls furnished with a bamboo or wooden trellis; they are always dark and full of smoke, as there is no chimney. The furniture is simple—a wooden couch, with mats and cushions, often a round table, with a few chairs, a hanging lamp, and perhaps a chest. If there is a second couch it is screened off with a blind. Each hut stands in a garden, surrounded by hedges (within which the whole village is also enclosed) and planted with palm-trees and plants which, from a distance, make the village appear as a grove of trees surrounded by fields of rice. In the gardens are often a barn and a well. The houses of native officials are frequently of wood or stone and consist of several buildings in a group; they are often furnished in European style. The Javanese, whose love of specialization is extraordinary, profess to distinguish various types of architecture in their simple buildings, which have a primitive and somewhat temporary character rendered necessary by the frequent earthquakes of the country. The religious buildings in the *desas* are, in particular, very simple structures of bamboo with an *atap* roof, and a floor some feet above the ground.

Clothing

The clothes of the Javanese common people are also simple, and the principal garment, the cotton skirt or *sarong*, is the same for both sexes. A man adds to it a cotton vest or jacket; his long hair is done up on the top of the head and covered with a handkerchief and a big hat, and every freeman wears the *kris* or sword. A woman wears the *kemben*, a wide bandage wound round the figure under the arms, and also a scarf, which is used by the poor people to carry their babies or their goods.

A Javanese woman always goes bareheaded in the presence of a man, but she decks her hair with flowers or pins. Men and women both go barefooted.

SUNDANESE

The Sundanese people are usually smaller than the Javanese, and are seldom more than five feet tall, but they are more muscular and strongly built. Their hair is thick but they have little beard ; their eyes are small and are set on more of a slant than are those of the Javanese, though they are not so oblique as those of the Chinese. The forehead is high, the nose short and flat and the cheek-bones broad. They are described as reserved, quiet, and timid ; they are terrified of possible dangers, and go in fear of bad spirits. Slow of speech and secretive, particularly towards Europeans, they are not cruel or revengeful, except when roused in anger, and they lead a simple, contented, and temperate life. Their good-natured hospitality and civility and their honesty make them attractive, but they are not thought capable of great development. Agriculture is their chief occupation, and their cultivation of coffee, pepper and cinchona, is considerable, but they show no desire to improve on ancient methods, and do not see the necessity of carrying on trade except to provide themselves with what they need, though they are often clever craftsmen, carpenters, and smiths. They are, in fact, of an altogether inferior civilization to the Javanese (though they tend to assimilate their culture where the two races come into contact), and are essentially a highland people, far less changed by Hindu and Arab influence than the Javanese. Their standard of living is not so high, and their dress is quiet and simple. Their houses are usually raised on piles, though those of the better classes stand on the ground. Like the Javanese they are very fond of feasting, and every birth, marriage, and circumcision is made the occasion for such an entertainment ; but they differ from the Javanese in that they are deeply attached to the practice of their religion. Since they were less influenced by Hinduism, Mohammedanism found them easier converts than the Javanese, but their Mohammedanism is of a doubtfully orthodox type, and is mingled with the remains of their original pagan beliefs. The Netherlands Mission Association has done good work among them, and the

Bible has been translated into the Sundanese tongue, which is related to Javanese, but is simpler and has a smaller vocabulary. This language is spoken in the whole of West Java, except in Batavia and neighbourhood, but is very much mixed with Javanese in Bantam and along the north coast.

MADURESE

The Madurese are usually also rather shorter than the Javanese, but are strongly built : the cheek-bones are prominent, and the face shorter and less finely modelled. Their women are often awkward and plain. As a whole they may be said to be considerably more independent than the Javanese, though perhaps less intelligent, and they show far greater freedom of speech and manner. They will never allow their rights to be infringed, and have a horror of enforced labour, but they are thrifty and hard-working, and are regarded by the Dutch as among their best colonists, since they acquit themselves better than the other inhabitants of Java of their duties to the Government. Their quick and vindictive temper, however, is notorious, and quarrels in which murder is done are frequent among them ; for the *kris*, which is to the Javanese an ornament, is to the Madurese a weapon of attack and defence.

The clothing of the Madurese people differs from that of the Javanese, and they and their dwellings have a comparatively careless and untidy appearance. In agriculture they are less painstaking than the Javanese, though the difficult soil of the island of Madura is of necessity well tilled ; cattle-breeding, however, is carried on to a much larger extent, and the Madurese are well-known as small traders, navigators, fishermen, and soldiers, though they make poor craftsmen. They have their own amusements, such as bull-racing and bull-fighting, but feasts are less numerous than among the Javanese, and, owing to their independent character, the law of custom carries much less weight with them. Their moral standard is high, especially in a country like Java, where lapses are regarded with indulgence. Their language is divided into East or Sumenep Madurese ; West or Bangkalan Madurese (of which Pamekasanese is an offshoot) and Baweanese. It has been strongly affected by the Javanese tongue.

TENGGERESE

The Tenggerese, or Wong Tengger (Highlanders) are an interesting race as forming the only extant remains of the Majapahit civilization in its last period. They have been settled on the slopes of Mt. Bromo or Brahma, their holy mountain, probably since the thirteenth century, and their religion is still distinctly Brahmin in character, though corrupted by animistic practices. They worship Siva and their household gods, and their two great feasts fall on the 14th and 15th of the second and twelfth months, the first being the feast of the dead and the second the great feast of atonement on Mt. Bromo. Though they only marry among themselves, they do not live an entirely isolated life like the Baduj, and are largely mixed with the neighbouring population in the lower villages, so that they have lost their peculiar customs to a considerable extent, and many of them have become Mohammedans.

The Tenggerese are said to number some six or seven thousand, and are increasing. In person they resemble the Javanese, but they are more strongly built, and somewhat darker in colour. Their morality is high; they are loyal and honest and good workers, but remarkably dirty. Their villages which stand at altitudes ranging from 5,800 to 7,000 ft., are usually built on a little hill, and are defended with bamboo palisades. The houses, which are arranged in long rows and are not surrounded by trees like those of the Javanese villages, are of wood with sloping roofs, and the villages strongly resemble those of the Alps. Flocks of goats are kept on the mountains. The chief food of the Tenggerese is maize, but they also cultivate potatoes and onions. Rice is a delicacy, and they are forbidden by their religious tenets to pound it. Polygamy is exceptional, but the *dukun* (the priest or holy man, who plays an important part in village life) generally has two wives.

BADUJ

The Baduj, who numbered about 2,000 in 1908, live in the woods of the Kendeng Mountains in South Bantam. They are the descendants of those people who refused to embrace Mohammedanism when it was introduced into Java at the end of the fifteenth century, and retired into the then almost impenetrable interior of the country, in order to remain true to

their own faith. They acknowledge a supreme invisible power called *Batara tenggal*, who once lived as a man, and other gods of lesser rank, mostly borrowed from Hinduism. The gods are said to dwell in a place to the south of their settlements, called *Archa domas*, which is held in the greatest veneration, and to which strangers are forbidden access.

The *Baduj* live in strict seclusion, and only enter into communication with members of the outside world under the pressure of urgent necessity; their dealings with the Government are carried on through a trusted intermediary. The women and children are not allowed to leave the *Baduj* district, and no one is allowed to intrude into their hamlets. The *girang pu'un*, the worldly and spiritual head of each village, may not leave its confines, or show himself to the uninitiated. The three inner hamlets must always contain exactly forty families, and are sacred ground, whilst the rest of the *Baduj* live in the outer villages. Anything which was unknown to *Batara tenggal* when he lived in this world is forbidden to them, so that they cannot employ horse, ox, or plough, or learn to write, or sleep on a bed. In general, they avoid any sort of luxury: dancing and music, coffee, opium, and tobacco are all forbidden to them. As can be imagined they are an undeveloped, and uneducated people, though the state of morality is very high, and theft is unknown among them.

KALANGS

Mention may also be made of the *Kalangs*, who form now only a handful of people living in Central Java. Their history is obscure, but it is established that they are an ancient race, and were for centuries a people to be reckoned with in Javanese life. In early times they led a wandering existence in the woods, gaining their livelihood as wood-choppers. They were tied down to settled dwelling-places, called *Kalangans*, in the eighteenth century by the Sultan of Mataram, and they now lead a sedentary life as coppersmiths, coopers, &c., being still employed as carpenters at the Court of Jokyakarta. Many legends are still told about them by the Javanese, but they are being gradually absorbed by the latter people, with whom they intermarry, and from whom they can hardly be distinguished in appearance or language, though they cling to certain characteristic customs at weddings and funerals.

CHAPTER VII

THE INHABITANTS OF THE OUTER POSSESSIONS

Sumatra (Achinese—Gajos—Alas—Bataks—Malays—Menangkabau Malays—Lebongs—Rejangs—Lampongs—Primitive tribes)—Islands adjacent to Sumatra—Orang Laut—Borneo (Dayaks)—Karimata Islands—Celebes (Toraja tribes—Buginese and Makassars—Minahasese—Gorontalese)—Sangi Islands—Banggai Islands—Moluccas—New Guinea—Papua Islands—Tenimber Islands—South-western Islands—Lesser Sunda Islands.

SUMATRA

Population : Numbers

THE total population of Sumatra in 1912 was 5,151,583, of whom 9,610 were Europeans, 223,153 Chinese, 4,145 Arabs, and 19,575 other Oriental foreigners. These figures are seen to be very small when compared with the large size of the island or with the crowded condition of Java. The exploitation of the great riches of Sumatra, only begun in recent years, is being carried on with energy, in spite of the difficulties placed in the way of the Dutch by the independence and courage of the natives, who have rendered the organization of their country a far more difficult problem than that of Java.

The most thickly inhabited part of Sumatra is in the western mountains, and the scantiest population is found in the marshy wooded plains on the east. In 1912 the population of the island varied from 76 per square mile in the West Coast government to about 11 per square mile in Jambi. Though the government of the West Coast is the most thickly peopled, the East Coast residency, which has a population slightly under the average for the whole of Sumatra, is economically the most important part of the island, and about one-third of the Europeans in Sumatra and four-fifths of the Chinese live there, though the majority of the Arabs live in Palembang. There were in 1900 only thirty-nine settlements in Sumatra having a population of over a thousand, and only five of these had more than 5,000 inhabitants. The chief towns, with populations in 1905, are: Padang (47,607),

Fort de Kock (2,290), Padang Sidempuan (3,128), Sibolga (17,611) Benkulen (7,721), Telokbetong (3,759), Menggala (8,976), Palembang (60,985), Jambi (8,815), Medan (14,250), Bengkalis (7,290), Kuta Raja (3,704).

Native Peoples

The peoples of Sumatra are ethnographically complicated, and there is, speaking generally, a marked difference between those living on the coasts, who have been for centuries in contact with foreigners, and the inland tribes who are still little known. From time to time many Arabs, Chinese, Hindus, Klings, and Bengalis have settled on the Sumatran coast, and Hindu-Javanese colonies were established for trading purposes at an early date in Palembang and Jambi. The mixed races which have resulted from such settlement have learnt to produce for purposes of trade, and have reached a higher standard of civilization than the tribes of the interior, who have been in the past only slightly influenced by Hindu and Mohammedan culture, and are still at a comparatively low stage of development, though they can mostly read and write, wear clothing, and have reached a certain state of proficiency in agriculture and the arts. The whole of the indigenous population had probably a common Malayo-Polynesian origin, but differences of habitat and economic condition, and isolation in separate groups, have caused the formation of many tribes, differing considerably one from another in appearance, customs, and language.

In spite of the enormous natural riches of the country, the natives often lead a poverty-stricken existence, only a very small part of the land being under cultivation. They sell what they do not need of the products of their hunting and fishing, but gain little profit from this, or from the local trade in gambier, pepper, spices, &c., owing to the rapacity of the Chinese, who have the commerce of the island in their hands.

Among the indigenous peoples those of the mountain country are more numerous and have reached a higher state of development than the plain-dwellers. The favourable influence of the mountain climate is noticeable in the case of the Bataks, and the most degraded of the peoples of Sumatra are found among tribes like the Kubus and Sakais who dwell in the lowlands.

Sumatra has never been united under the rule of a native prince, but has always suffered from a division into small groups

of people, which has prevented economic and industrial development; the scarcity of indigenous labour has also made the exploitation of the island by foreigners a matter of difficulty. The slow improvement of the means of communication and the extension of the holdings of European planters will probably result in the gradual subjugation and civilization of the tribes which are still outside the Dutch administration, and as the people are brought more closely under control, they should increase rapidly in numbers, the scarcity of population in the island being largely due to the absence of hygiene and the exhaustion of women by premature marriage and hard work.

The chief peoples of Sumatra, starting from the north of the island, are the Achinese, the Gajos, the Bataks, the Malays, the Menangkabau Malays, the Lebongs, the Rejangs, and the Lampongs. There are also some small and savage tribes living mostly in the forests of the East Coast, and the inhabitants of the various islands fringing Sumatra, chief amongst them being the people of Simalur, Nias, the Mentawai Islands, and Engano on the west, and Banka, Billiton, and the Riouw-Lingga Archipelago on the east. These various peoples, who differ considerably one from another, will now be separately described.

Achinese

The Achinese inhabit the ancient kingdom of Achin (Acheh, or in Dutch, Atjeh), which lies in the north-west promontory of Sumatra, and the whole of Sumatra to the north of the Gajo country.

In general they are thinner and smaller than the Malays, their skin is darker, and their eyes larger. There are noticeable differences between the people of the coastal districts (*orang tunong*) and those of the highlands (*orang barok*). None of the Achinese have a virtuous reputation, the highlanders being notorious thieves and murderers, and the lowlanders degenerate and intemperate. The highlanders are prouder and more courageous and independent than the lowlanders, who have come more into touch with strangers, but the main characteristic of the people has been said to be their love of warfare. Since they are daring and persevering, however, it is probable that they will develop into an important people under the influence of European rule.

The origin of the Achinese people is not known, but they are of mixed race. The clothing of highlanders and lowlanders is different, but both sexes wear the wide Achinese trousers. The usual food, which is eaten twice daily, is rice, with fish and vegetables, the people of the mountains being more frugal and simple in their requirements. Betel-nut is used universally, and many people smoke opium ; this habit is most prevalent in the colonies of pepper-planters on the coasts, where the vices of the Achinese are found at their worst. The use of strong drink, however, is restricted to the upper classes.

Achinese houses are much the same all over the country ; they stand on piles, and are divided into several rooms, with a back and front verandah, reached by steps. Annexes are often built for the accommodation of married daughters. Each house stands in a fenced courtyard, planted with fruit-trees and containing a well, and the smaller domestic animals and birds live under the houses in accordance with the common practice in Sumatra. The private room of the family owning the house is hung with cloth and covered with matting, but the Achinese are dirty, and their houses are always untidy, and are of very light construction, so that they are easily taken down and put together again. The villages, like the houses, are surrounded by a fence. They have been largely depopulated, owing to the inhabitants taking to the woods in order to carry on a guerilla war against the Dutch.

The *meneusah*, the building in which sleep the young unmarried men, strangers, and sometimes those men whose mother lives in the village, but their wife elsewhere, usually stands outside the village. It is used for meetings and for religious observances, which are seldom carried out with much fervour or regularity. The custom of making the young men sleep apart is very ancient, and is found among both Mohammedan and pagan peoples in Sumatra.

Achinese society is divided into families, and all the descendants of a common ancestor in the male line are members of the same tribe (*kawom*) though this family division has been superseded for governmental and administrative purposes by territorial divisions for a long period, and has little practical significance. Marriage is celebrated at an early age, often when the girl is eight or ten years old, and the man sixteen. The wife does not go to her husband's village to live, but has a room

in her mother's house, where he visits her ; the time during which this arrangement endures depends on the size of the gift made to the bride's parents, each twenty-five dollars of the gift making it obligatory on them to support their daughter for a year. Divorce is rare, and only occurs after bitter quarrels between husband and wife, partly because of the large obligations to his wife's relations under which a man is placed. Polygamy is not common, except among the princes and chiefs, but slaves, who came mostly from Nias, and were kidnapped in large numbers up to a few years ago, were formerly kept as concubines. The position of the Achinese women is high ; the old kingdom was frequently ruled by women-sultans, and they are usually competent and intelligent. There are still many traces of the old matriarchal form of society, though the patriarchal system is now general, and since the mother lives in her parents' home, where the husband is more or less a stranger, the children are brought up by her. The mother's uncle, however, is not responsible for his nephews and nieces as among the Menangkabau Malays, and the father has full facilities for concerning himself with his children's welfare. If a man has more than one wife, they usually live in different villages, and the man divides his time between them and his own family, often also working away from home as a sailor, fisherman, or planter.

Agriculture is the chief means of subsistence among the Achinese, and rice is grown on the wet and dry systems. There are a large number of uncultivated fields in the highlands, since the Achinese are by no means energetic agriculturists, but the land in the lowlands is better tilled. The fields are owned by the village as a community, and are used as a grazing ground by the villagers after the harvest is gathered. If any one wishes to grow a second crop of any kind, he must enclose his piece of land. Pepper, sugar-cane, fruit-trees, &c., are grown, and cattle-breeding is carried on. In the lowlands, agriculture is the work of the men, but in many parts of the highlands the women labour in the fields ; landowners hire companies of people, who are paid in kind, to till their land.

Silk-weaving is a considerable industry among the Achinese, and there are also goldsmiths, wood-carvers, and shipwrights, but the standard of industry is not very high, and both industry and agriculture have necessarily suffered greatly from the effects

of the long war. There is a considerable trade on the coast in products from the interior.

The Achinese language, which is written in the Arabic character, is related to Malay, and is divided into four dialects : *baru*, or lowland language, *tunong*, or highland language, *pedis*, and *pasei*. The state of education is naturally not advanced, but the children are taught to recite the Koran, and the Achinese have a considerable body of literature of their own, fables, stories, religious works, &c., largely in verse, which are partly in writing and partly handed down orally. The natives are very fond of competing in recitations of poetry, and performances of music on the native instruments and orchestras are much in favour. As among the Javanese, feasts are indulged in on all important occasions, and the people love gaming. Many animals are kept for fighting.

The Achinese are Mohammedans, and though they do not observe their religious duties strictly, a large number make the pilgrimage to Mecca, and they lay great stress on the necessity for carrying on the Holy War, as the Dutch know to their cost. Circumcision is practised, and the teeth are often filed, though not, in the case of women, till after marriage. As with most of the Mohammedan peoples of the archipelago, the power of the *adat* exists side by side with that of the religious law of Islam.

Gajos

The Gajo country lies in the interior of the north of Sumatra, on a high plateau broken up and surrounded by forested mountains. The peaks rise to over 9,000 ft., and the Gajo settlements are five to seven days' journey from the coast. The population is grouped in the wide grassy valleys lying between the mountain ridges which break up the country, and divide it into the Tawar Lake district to the north ; the Dorot district (including Samarkilang) between the north and central chains ; the Gajo Luos district, or Great Gajoland, between the central and southern chains ; and Serbojadi in the mountains to the north-east. In many places the Gajos have expanded outside their enclosed and mountainous land ; they were estimated in 1912 as numbering 50,000 to 60,000, and half of the inhabitants live in Great Gajoland ; the country, however, is so thinly populated that the settlements only form isolated points in the wilderness. The only means of transport is on the backs of the natives themselves,

and the export trade to the coast in cattle and forest products is only sufficient to enable the Gajos to procure tobacco, salt, and the small luxuries of which they stand in need, though there is a considerable trade in horses with Achin.

The narrow forest paths are the only means of communication, and there is no relationship observable between settlement and trade or communication ; the Gajos are, in fact, a self-supporting and agricultural people, and up to about 1900 practically nothing was known of their country.

In spite of the way in which their country is cut up by the mountains, the Gajos form an ethnographical unit, all speaking one language, though they differ in appearance and speech in different parts. They are related to the Bataks, and are probably a mixed race of Batak and Kabu origin, but owing to the long period during which they have been under Achinese suzerainty, they have adopted their clothing and manner of wearing the hair so that at first sight they resemble the Achinese more than the Bataks in general appearance. Each tribe has its own characteristics, but they have in general flat faces, with deep-set eyes and a broad nose, and their hair is long and brown. In character they are open and honest ; the men are friendly, but the women are shy of strangers.

They are almost all agriculturists, and the chief crop is rice, usually cultivated on the wet system, though cotton, sugar-cane, maize, &c., are also grown. The high land round Lake Tawar is much less fertile than the comparatively low-lying Gajo Luos country. The districts which are the more favourable for rice-cultivation are the most thickly inhabited, and the villages here are large and permanent, and surrounded by extensive fields, with flocks of horses and buffaloes. The steppe country and the pine woods, on the other hand, are very thinly settled, and the houses are mostly small, and built of bamboo ; these settlements are moved elsewhere, when in the course of a few years the cultivated ground round the village becomes exhausted.

The permanent villages are well kept, and consist of long, well-built houses of wood, roofed with leaves, and standing on piles. They are built at regular intervals along the broad village street, surrounded by gardens and separated from each other by hedges. Each house is inhabited by a number of families bearing the same name, the men and women living in different sides of the house, but each family has its own room and its own

hearth, while there are also two large galleries, one for the men and one for the women, which are common to the whole house, and are approached by a flight of steps, which is often beautifully carved. When the patriarchal family becomes too large to be accommodated in one house, another is built close by, so that a whole village may consist of people all bearing the same name, and belonging to the same family. The young unmarried men live apart in a large building on the outskirts of the village, only taking their meals in their family house. This building, which is called the *memassa* or *morosah*, is also used for the accommodation of strangers, and is enclosed by a strong wooden wall. The *messigit*, the house of prayer, also stands outside the village; it is not built on piles like the houses, and is often crowned with a roof of several stories. Such buildings are few, since the Gajos do not observe their religious duties at all strictly.

The Gajos are clever craftsmen, and are accounted the best potters in the archipelago; each house possesses a number of decorated pots. They are also clever wood-carvers and smiths, and make elaborately plaited and ornamented mats, whilst the women weave beautiful material for their own garments. Each community thus provides for its own needs, and there are no large markets as in Acheh. The making of their weapons and the use of currency has been borrowed from Acheh.

The Gajos are Mohammedan by religion, and the priests wield a considerable influence, but they are by no means fanatical, and like all Indonesians they have many superstitious beliefs about good and evil spirits, and contrive to combine the influence of the family *adat* with that of the Koran. The rite of circumcision is their chief religious ceremony. They are really a quiet people, but owing to their ancient subjugation to the kingdom of Achin, they have been obliged to take part in the confused fighting of the Achinese war, and have made a brave struggle for their freedom.

The Gajos have no territorial divisions, but are separated into tribes and families. The tribes do not live together, but are scattered in different villages or *kampongs*; so that, though each tribe is under a single head, the *kedjuron*, each patriarchal group or family is governed by its own head or *raja*. Frequently these local branches split up into separate organizations, and build a new village for themselves. The family is perpetuated through the males, and when there is no son in the family,

a stranger, an Achinese, Malay, or Batak, is adopted in his place. Bataks and people from Nias were also frequently kept as slaves in the past, and these customs have caused a considerable admixture of foreign blood among the Gajos. Women are not allowed outside their own village, except to make the pilgrimage to Mecca, which is rarely done. Wives are bought from other tribes, but have a fairly good position ; polygamy and divorce are both rare, and the men do not contract marriage young, since it is expensive. The father of the bride must be paid his price, and the festivities, at which magnificent garments are worn, last several days and nights.

Alas

The Alas, living in the fruitful valley of the middle course of the Simpang Kiri, numbered about 8,000 in 1909. They have a strong strain of Malay blood, and mingle Batak, Gajo, and Malay influences in their culture. In spite of their close connexion with the Gajos, they do not gamble or smoke opium.

Bataks

The Bataks are a Malay people, estimated at a quarter of a million in number, and resembling in many respects the East Coast Malays, whose original home was in the mountainous country round Lake Toba, but they have spread over a large extent of country in the north of Sumatra, and now occupy the residency of Tapanuli, and part of the east coast, as well as their ancient highland country.

They are divided into several groups who differ considerably in language and customs. The chief of these peoples are the Toba Bataks, who are far the most numerous, and live in the centre round Lake Toba ; the Karo Bataks, to the north of Lake Toba ; the Pakpak Bataks and the Dairi Bataks, living in the Dairi country ; the Mandailings, who are Mohammedan by religion, and have been much influenced by Malay culture, in Mandailing and Padang Lawas ; the Angkola Bataks, in Angkola, Sipirok, &c., and the Timur and Simelungo Bataks to the east of Lake Toba.

The Bataks may also be divided into *gunong* and *dusun* peoples, i. e. those still living in the comparatively inaccessible mountains, and those who have overflowed into the lower

country of Langkat, Deli, Serdang, &c. The unproductive and comparatively inaccessible mountain or *gunong* country, where the ground is cut up by ravines and largely covered with forest, is naturally the most thinly populated; the people are often semi-nomadic, moving to fresh ground every few years. Their villages are therefore smaller than the permanent villages in the lower or *dusun* country, where the land is more fruitful, and has been largely cleared for tobacco cultivation, &c. In the Pakpak country, for instance, which is covered with primeval forest, there are only about sixteen people to the square mile. The Bataks, however, seem to prefer their native highland country to the more fertile and settled land; and its isolated position, shut in by mountains, enabled them, up to late years, successfully to resist all foreign influences.

Batak society is patriarchal in character, and is divided into tribes and families (*marga*). A village community is composed of the ruling family, i. e. that which first settled on the spot, another family related to the ruling family by marriage, and members of strange families who have settled there subsequently. The village is administered by a council of men, and the head (*pengulu*) is responsible for the community and is the leader in time of war; these chiefs and their descendants form a sort of nobility. Slavery, which was formerly very common, is now a thing of the past. In parts, the land belongs to the family or the village, and those who are not members of the *marga* have the use of the ground they clear only for a certain time. Land-tenure differs considerably, however, in different districts.

The villages and houses of the different Batak tribes are also divergent in character. The Karo settlements are usually only surrounded by a hedge and trees, but in some parts of the Batak country they are fortified with earthen walls and bamboo palisades. Each village has usually a square in which stands the block for stamping out the rice, and the 'town-hall', which forms a meeting-place for the villages, and where the unmarried young men and the strangers sleep. The houses, with their picturesque horned roofs, are as a rule built close together, and there are often rice-barns and buffalo-sheds in addition. The Karo houses always have a long passage running through them, with the family hearths on each side, and a balcony at each end, but the Pakpak houses have a central hearth reached by a ladder,

and a gallery in the upper part of the roof for the women's use. In the Toba country many of the houses are miserable huts of straw or clay. All the houses, which are very dark and smoky inside, stand on piles, two to eight feet above the ground, and consist of a large room which is divided up by mats at nights; sometimes twelve families or more inhabit one house. The buildings are often beautifully decorated, as the Bataks are clever craftsmen in wood, ivory, and copper.

Marriage among the Bataks is exogamic; wives are purchased and leave their own tribe and family for that of their husband. The women are kept in a subordinate position; they have nominally no possessions of their own, and are always overworked, since the larger part of the field-work is in their hands, but they are kindly treated and content. Polygamy is common, and the moral standard is not in general high. The Bataks have for long been notorious as cannibals, but it is said that the custom, which was largely punitive and ritualistic in character, has now disappeared. They are, on the whole, a quiet and easy-going people.

The Batak girls are often good looking, with round faces, large eyes, and well-formed features. The teeth are usually filed and blackened in the north and centre of the Batak country, and heavy silver earrings, necklaces, and rings are much worn. The Bataks often wear clothes of Malay or European origin, though the mountain peoples still spin and weave their own stuffs, and wear the original native dress.

The Bataks are almost all engaged in agriculture. Rice cultivation, both wet and dry, forms the chief means of livelihood, and maize, coffee, fruit-trees, and vegetables are largely grown. Horses, cattle, buffaloes, and pigs are commonly kept, especially in the mountain country. Batak education is on a comparatively high plane, and many work as teachers, doctors, and traders at the local markets. The inland trade has grown to considerable dimensions under Dutch rule, but the export trade from the mountain country is very small, except for the horses and cattle taken to the east coast, and the benzoin and rubber trade of the Pakpak country, the profits of which go, not to the natives, but to the middlemen. There is little connexion between trade and settlement, and paths are still largely the only means of communication. Parties of Bataks come down to the coast to get salt and other necessities, and Malays go up

to the highlands to collect forest produce. Many Bataks are also to be found working in European undertakings, or as traders and shopkeepers in the coastal country.

The Bataks formerly ruled over the larger part of northern Sumatra, and reached a fair degree of civilization through the influence of Hindu-Javanese settlers, which is still to be observed in their buildings and ornaments. There are traces of Hinduism also in the old pagan religion, which is still prevalent in the northern part of the country, though Mohammedanism is widely spread in the south, and Christianity has also made considerable headway among them, particularly in the centre of the country ; many pagan customs, however, still flourish in connexion with birth, death, marriage, and agricultural operations.

A number of dialects are spoken by the Bataks, which may be divided into the Toba group and the Dairi group, the former including the Toba, Angkola, and Mandailing languages, the latter those of the Dairi, Pakpak, and Karo country. The dialects of the country east of the Toba Lake, Timur, and Simelungo, form a link between the two groups. The Batak script is of Hindu origin ; there is not a large amount of written literature in existence, but the natives are fond of relating stories, which are handed down from mouth to mouth, of playing and singing, and of dancing. Their leisure time is also spent in various games and amusements which give scope for their innate quickness and cunning. The Bataks respond quickly to education, and under good guidance, will probably develop very rapidly.

Malays

The Malays (using the name in its narrow sense, as applied to a particular tribe) differ from the other peoples of Sumatra, who are all inland races, in that they are a seafaring people, who have in the course of time emigrated to all the coasts of the archipelago. The only parts where they live as a racial unit are Malacca, the east coast of Sumatra, the Riouw-Lingga Archipelago, and Palembang. The Malay emigrants have naturally incorporated many elements through racial intermixture, and even the Malays of Sumatra, inhabiting as they do in Palembang one of the chief trading centres of the island, have a considerable strain of Javanese blood, derived from early settlers, and have not preserved their peculiar characteristics in the same way as

have the Menangkabau Malays, who have undergone a process of isolated development.

The Malays have a light-brown, sometimes an olive skin ; their hair is thick and smooth, and beards and moustaches are very little worn. They are shorter than Europeans, but strongly built, with broad, flat faces, prominent cheek-bones, small flat noses, and large thick-lipped mouths, and they are on the whole a fine-looking people, particularly the women.

The Malays are intelligent, polite, and friendly, though they are reserved and mistrustful with strangers. They are talkative and humorous, devoted to sport and gaming, but not addicted to strong drink. They are quick to imitate, and make good workmen, when they possess the necessary power of perseverance, but they are lazy and have no idea of regularity or of the value of time, and are stigmatized by some observers as cruel, untrustworthy, and revengeful. The Bataks, in spite of their independent nature, have been found more satisfactory workers in the tobacco plantations than the Malays, who can earn a livelihood with very little exertion by planting rice on the tobacco-fields, after the tobacco is gathered. Though they are clean in their persons, and love fine clothes and adornments, their houses are dirty and untidy.

The Malays have the feeling of tribal relationship very strongly developed ; they are extremely superstitious Mohammedans by religion.

Since they are a cosmopolitan people, they have carried their language all over the archipelago, and it forms a *lingua franca* for traders, officials, and missionaries. The number of people who speak it as a mother-tongue was only about three million in 1905, including some half-million Chinese and non-Malay natives. The Malay districts of Sumatra are thinly populated, and the Malays do not seem to multiply rapidly, as the Javanese do.

Menangkabau Malays

The Menangkabau Malays form a remnant of the primitive Malay race, which has undergone separate development from the other Malay peoples, owing to its isolated position. They now inhabit the Padang Highlands and the neighbouring country, but the ancient kingdom of Menangkabau covered the larger part of Central Sumatra, and owing to the long period

during which they have been a powerful and important people, they have attained a considerable degree of civilization. Though they are not devoted parents, so that their children become independent at an early age, and receive little or no education, the Malays of Menangkabau are capable of development, and learn very quickly when they have a suitable opportunity. They have a keen artistic sense, and skilful fingers, so that they are famed as craftsmen ; and though they are not particularly clever or strenuous agriculturists, they are first-rate traders.

They have, however, many bad points, and are described as untruthful and dishonest ; arrogant to their inferiors and servile to their superiors ; intemperate in food and drink, and uncleanly in their persons ; and notoriously unfaithful to their wives. They love to work and gossip in company with their fellows, when quarrels usually ensue. They are deeply attached to their ancestral customs, obstinate, and unforgetful of any injury.

The Menangkabau Malays are a strong and well-developed race, of middle height. The forehead is broad, and lower in the women than in the men, so that it is customary for the women to shave the hair in front to give an appearance of height. The face is square, with prominent cheek-bones, the eyes are bright and rather protuberant, and the nose small with wide nostrils. The teeth are filed and blackened, and huge ear-ornaments are worn by the women. The men usually wear their coarse black hair short, and few have a beard ; the women dress their hair in various different ways, and the children and young people are often decorated with white paint, especially at festivals. The clothing varies according to the district ; at home or at work the men only wear a head-covering and short trousers or a piece of cloth, but at different times many more elaborate garments are put on. The women wind a piece of stuff round the body which falls to the feet, and over it often wear a shawl or scarf, with many ornaments of wood, copper, gold, or silver.

The household industries of the Menangkabau Malays are manifold ; the men are smiths, boat-builders, wood-carvers, and painters ; they work in lead, and dig for gold. The beautiful materials which the women make are renowned, though European stuffs are now much used. Their weapons, houses, and ornaments are finely decorated, the houses are built of wood or bamboo, with a horned roof of leaves, and usually stand on piles. In some

parts they are surrounded by gardens, where the domestic animals are kept, and coco-nut palms are grown. In other districts they stand close together in a clearing. Near the houses are the rice-barns, which are often beautifully decorated. The back part of the interior of the houses is divided into separate sleeping apartments, and the front forms the family living room ; the door is reached by a ladder. In each village are several communal buildings, such as a council house, a mosque, a school, and an inn. Markets are held in the large square once or twice a week. Several families bearing the same patronymic live in one house, each mother with her children having a separate apartment. A number of houses together form a *parin duan*, and several of these larger communities a tribe. Marriage between members of the same tribe is forbidden.

Society is based on the matriarchate, i. e. descent and inheritance are in the female line. When a woman marries a man, and bears him children, she does not leave her home, but continues to live with her kinsfolk on the mother's side, and the head of the household is her uncle, who takes the place of a father to his nephews and nieces. A married man has thus no home of his own, and visits his wife only at night, spending the rest of the time in his mother's house. The names, property, and privileges of the children all derive from the mother's side. The women are naturally influential among the Menangkabau Malays, and as they are hard-working and thrifty this is no doubt partly the reason of the prosperous condition of their country.

The Menangkabau Malays are divided into the upper classes (which include the descendants of the princes, the priests, the heads of the different tribes and the councillors), the lower classes, and formerly the slaves and bondmen as a third class. The differences between the classes are not strongly accentuated.

The people live chiefly by agriculture, trade, fishing, and hunting. Uncultivated ground is the property of the family or the village, by which alone permission to collect the products of the forest is given except in the case of wood, honey, sugarcane, and resin. The chief crops are rice (grown both wet and dry), pepper, indigo, coffee, tobacco, gambier, maize, and barley. The natives are disinclined to work harder than is necessary to supply their own needs, but they are very successful in agriculture and in collecting forest produce, and are renowned traders, so that though retail trade flourishes throughout the

Padang highlands, there are few Chinese merchants in the country. Cattle-breeding is not so well developed as agriculture, but horses, buffaloes, and goats are much used.

Menangkabau Malay is spoken in the government of Sumatra West Coast, in the upper part of Jambi, and on the upper Kwantan. It is one of the two chief branches of the Malay language, and probably the more ancient.

The literature of the language is mainly concerned with legendary tales, and is largely poetical in form. In old times the Menangkabau Malays used the Javanese script, judging by inscriptions of the Hindu period, but now they use the Arab alphabet. Hinduism left, indeed, but little impression on the Malays, and there are only a few words of Sanskrit origin in their language. The Menangkabau laws, which are preserved in writing, are relics of the ancient kingdom still in force.

Lebongs

The Lebongs are a Malay people, living in Lebong (Rejang-Lebong), a highland district on the west coast of Sumatra. They numbered some 3,700 in 1905, having decreased largely in the previous century. They are a strong, good tempered, and hospitable folk, devoted to gaming, which impoverishes many of them, even in a fruitful land like Lebong. In manners and customs they closely resemble the other Malay races of central Sumatra. Their houses are distinctive: the roofs, which are of *rumbia* leaves or split bamboo, are flat; the walls are of bark, and the pillars are carved and painted. The spacious and well-built villages stand in a square, with the houses close together, and few trees to be seen. The women wear many bracelets and head ornaments, and colour their eyelids blue.

The Lebongs are Mohammedans, but as usual among Malay peoples they conserve many remnants of their pagan religion; most of the men speak Menangkabau Malay, but Rejangese is their native tongue, and they have a fairly extensive literature. The population is divided into patriarchal families, called *marga*, and the chiefs of the families of the villages are responsible to the Dutch administration. The men are largely occupied in bird-catching and fishing, but rice, sugar-cane, tobacco, &c., are grown; coffee cultivation is becoming more and more common, and coffee is exported to Muara Bliti for Palembang, with birds' nests and cardamom. Cattle are few, and industry is not highly

developed, though there is a considerable amount of silk-weaving, pottery-making, wood-carving, &c. Before the establishment of Dutch rule, the Lebongs were largely independent. Owing to the healthy climate the infant mortality is comparatively low, but the people have suffered much from cholera epidemics.

Rejangs

The Rejangs are also a branch of the great Malay family, living in Rejang in the west of Palembang, and influenced no doubt by Javanese immigration ; but they are a much less tractable and hospitable people than their neighbours, the Lebongs, and their taste for fighting and robbery has given trouble both to the princes of Palembang and to the Dutch government. They are Mohammedans, with the usual admixture of paganism, and a strong belief in good and evil spirits. They are divided into four *margas*, and their houses, which resemble those of the Javanese, have a projecting roof over a verandah and stand on piles. The villages resemble those of Lebong, and cultivation is carried on on the same lines as in that district, but cardamom is not grown. Coffee cultivation has become of great importance in the last fifty years. The Rejangs maintained their independence for a long time, though many of them emigrated to Pasumah and Benkulen, where they came under the rule of the Sultan of Bantam ; they were estimated as numbering about eight thousand in 1905. Their script and language are Hindu in origin, but contain many Malay words.

Lampongs

The Lampongs inhabit the district of the same name in the south of Sumatra, and are thought to form part of the indigenous population of Sumatra, with a considerable admixture of Javanese blood. They have probably possessed a fairly high degree of civilization since Hindu times, and they live a settled agricultural life. They are divided into tribes on the communal system, and the descendants of the first chief of the Lampongs are held in great honour, and act as judges, though they take no part in the administration, which is carried on by the elder of the village and the heads of the families. The country is thinly peopled, and the population is only increasing slowly. The villages usually lie some distance apart along the rivers (though on the south coast they are more numerous), and the village life

centres round the communa^l house, the *balé*, where the council meets, feasts are given, and strangers lodged. The bamboo houses, which stand round the *balé*, are built high above the ground on piles, and are sometimes painted and decorated; they have often two or even three stories, with several rooms on each floor, and each house stands in its own piece of ground.

Many differing judgements have been passed on the qualities of the Lampongs, but they are mostly unfavourable. They pay great attention to their innumerable social distinctions and dignities, which are bought by all who can afford it, and every one aspires to sit on the seat of honour (*papadun*) at banquets, a position only to be reached by those who have plenty of money to spend on feasts, and no stain on their family name. High titles formerly granted by the Sultan of Bantam are also borne by many people. Apart from the respect given to the bearers of such honours, they can command higher dowries for their daughters, since marriage by purchase is the general rule among the Lampongs, the wife becoming the property of her husband, and, after his death, of his brother or other male relative. There are perhaps more forms of exogamic marriage in existence among them than among any other people of the archipelago. Engagements are often entered into at a very early age for family or political reasons, but are not consummated against the wishes of the couple when they reach years of discretion. The unmarried women wear large numbers of silver ornaments, and display their dowry in this manner at feasts.

The Lampong language has no resemblance to Malay, but has more affinity with Batak and Sundanese. The Lampongs are largely Mohammedan, and the old *adat* is giving place more and more to the law of Islam.

Primitive Tribes of Sumatra and Adjacent Islands

The most primitive tribes of Sumatra have in many cases become Islamized in late years, and they all take a pride in copying the language, manners, and customs of the Malays when they are brought into contact with them. There are, however, several small tribes still living in their original primitive condition, particularly the Kubus in Jambi, the Sakais, Tapungs, and Akits in Sumatra East Coast, the Lubus in Mandailing, the Benua in the Riouw-Lingga Archipelago, and the Orang darat or Orang gunong of Banka and Billiton.

These peoples are decreasing in numbers, partly owing to their absorption by neighbouring and more civilized peoples, and partly owing to their susceptibility to various diseases. In 1915 there were about 400 Kubus living an entirely uncivilized life in the Duwabelas Mountains, whilst there were 1,925 Lubus in Mandailing in 1912, and 300 Akits in Siak in 1908 in the same condition : the Sakais were said to be rapidly decreasing in 1909. All these peoples are peaceable and kindly, but extremely shy (though the Tapungs, in the basins of the Tapung Kiri and Tapung Kanan rivers, are less so than the others) ; they live an isolated life in the forests, despised by the Malays, from whom they obtain necessities by barter. Physically they are of mixed origin, and there are many individuals with curly hair, especially among the Kubus : in general, with the exception of the Lubus, they differ considerably from the Malay type. The Sakais are thought to resemble closely the Veddas of Ceylon. The Kubus live a wandering life, building shelters of leaves and subsisting by hunting and on forest produce ; the Sakais and Akits grow a little rice, but are semi-nomadic, building miserable little huts, and live largely on tapioca, and by hunting and fishing, as do the Lubus, who have, however, advanced far enough towards civilization to wear some clothing. The Tapungs are more developed and intelligent, and are often good craftsmen : their country is on the trade route from east central Sumatra to Singapore, and there is a considerable amount of money in circulation. Rice is grown on the upper Tapung, and the land along the rivers is very fruitful.

Simalur

The people of Simalur are few in number and live mostly on the coast. The original inhabitants speak a variety of dialects, but Malay is understood, and Malays and people from Achin and Nias have settled on the island and mixed with the natives. The people, who are good-tempered and gentle, are poor and undeveloped, and since all they need is provided by nature, they are disinclined to labour, only a small proportion of the land along the coast being under cultivation. The island is famous for the ships which are built by the natives, and also for its buffaloes. Goods exported are not bartered, but are paid for in copper money.

Nias

Nias is the most thickly populated of the islands of the Sumatran west coast, but estimates of the number of its inhabitants vary largely. The origin of the natives is uncertain, but they resemble the Bataks in many respects. The people of the northern plains of the island differ considerably from those of the south in language and appearance : the latter are more prosperous and energetic and better-developed physically than the former. The skin of the Niasese varies from light yellow to light brown ; the women, who are well-built, though they have a peculiar walk due to the heavy burdens which they carry, are much sought after by the Malays. Though the people are intelligent and imaginative, they bear a bad character for treachery, theft, and intemperance ; vendettas between families, and villages are endless, and though the natives work well away from their own island, in their homes their time is wasted in idleness, and their substance in costly entertainments and gold ornaments, so that they are constantly in debt. Yet they do not smoke opium or gamble, and are a gay, good-natured, and hospitable people ; the Niasese of the south in particular are brave and self-sacrificing, and sexual morality is generally high, since any lapse is severely punished.

The Niasese are clever builders. The houses stand on piles, and have a round or pointed roof with windows in it ; in the centre is the common room, where the unmarried men sleep, and where the wooden statues of the household gods are hung, and round it are the separate rooms for the different families living in the house. The entrance is in the floor of the central room, and is reached by a ladder. The houses of the chiefs and notables are often very costly, and in front of them, and also at the entrance to the village, stand statues or decorated seats of wood or stone.

The villages in the north usually stand on a steep hill, and in the south, where they are larger and lie on level ground, they are fortified with double walls, necessitated by the constant wars between one settlement and another. For the same reason the Niasese always carry weapons, and houses standing alone outside a village are seldom met with. In most parts of the island the men wear only a loin-cloth, and the women a short skirt, though in the more prosperous south, and where the influence of mission-

aries has penetrated, more attention is paid to clothing; the ceremonial costume and ornaments of a chief are usually very elaborate and costly. Tattooing of a simple character is common, the teeth are filed, and the rite of circumcision is observed, though it has no religious significance. The Niasese are good and artistic craftsmen in gold, silver, and wood, though their work is far below the level of that of the Malays. The women plait and weave. Marriage is exogamic: wives are procured by purchase, and taken by the husband to his own village, only the well-to-do affording more than one wife. At a man's death, his wife and all his property goes to his brother, and his body is kept for a long period in the house, till the requisite number of pigs has been sacrificed, the pig being the chief domestic animal of the Niasese, and playing an important part in their domestic and religious life. Feasts, accompanied by dancing, music, and much drinking of palm-wine, are given to celebrate every important event.

The hereditary chiefs of the tribal families and villages are assisted by a council of notables, which meets in the village square in the north of the island, and in the communal house in the south, and administers a rudimentary sort of justice. Debtors (who are freed on payment of their debt), orphans, and prisoners-of-war are kept as slaves, but the slave-trade with the mainland which flourished formerly is now almost at an end, owing to the efforts of the Dutch Government. The land belongs to those who settle on it, and is inherited in the direct line.

Trade, which is still largely carried on by barter, is in the hands of the Malays, Arabs, and Chinese, though in the south, where traders are few, the Niasese go themselves to sell their produce in the towns on the Sumatran coast. The Malays and Achinese have been settled for centuries in the north of the island.

The Niasese are pagans: human sacrifices are still made at the burial of a chief, and head-hunting and other deeds of violence are still common in the interior and south of the island, though the slow spread of Dutch influence will probably bring the native chiefs to order before long. The lack of a written script, the constant succession of petty wars, and the power of the *adat* stand in the way of the development of the Niasese, who are really capable of improvement.

Mentawai Islands

The people of the Mentawai Islands, who were estimated as numbering about 12,000 in 1905, are probably of Malayo-Polynesian origin, and are thus related to the indigenous population of Sumatra. They are of middle height, the women being short and thick-set; their skin is a golden-brown, their hair black and slightly wavy, and their eyes dark. The mouth is less prominent than in the case of the Malays, and the nose broad and flat. They are thought to resemble strongly the people of Hawaii, and the likeness is heightened by the custom common to both races of wearing flowers in the hair and behind the ears. The Mentawai islanders tattoo the body and face, and only wear a single garment, a hat of leaves or bark, and ornaments of coral and brass-wire, since they have no knowledge of weaving.

They are a cheerful and gentle people, though undeveloped and simple, and given to some objectionable customs, such as burying the limbs of a man, who is killed for the purpose, under the piles of a new house. Though they are a peaceful folk among themselves they are inimical to strange peoples; they raid the neighbouring coasts and islands and attack any ship they meet with on their voyages. Weapons, chiefly bows and poisoned arrows, are always carried.

The houses of the Mentawai natives are solidly built of bamboo and *atap*, and stand on piles, the gabled roof often reaching down to the floor at each side. The man is the head of his own family and marriage is either exogamic or endogamic; the women are kindly treated, and immorality among married people is most severely punished, though sexual morality among the young people is very low. Divorce is forbidden, and polygamy is not practised. Religion consists in fetichism and worship of good and evil spirits; the natives have no temples, but they set up a bamboo cylinder in a forest sanctuary and decorate it with scraps of cloth, leaves, and flowers.

The chief occupations of the Mentawai islanders are fishing and hunting, though no large animals are found in the islands, and fish, flesh, and sago form the chief part of their food. Agriculture is at a low state of development, but coco-nut palms, fruit-trees, sugar-cane and tobacco are grown. The field-work and the fishing are carried on by both men and women.

The islands are covered with forest, and most of the people

live on the coast and along the rivers, communication being carried on by water. Since the natives are a sea-faring race, the chief industry consists in the building of large sailing-boats; forest products are also collected, and are bartered with the Malays and Chinese of the west coast of Sumatra.

There is no central administration in the islands, the people being governed by their own village chiefs, who are, however, rather councillors than rulers. The chief amusement of the natives consists in feasts, accompanied by dancing and beating of drums. In their houses, language, and culture they strongly resemble the Karo Bataks.

Engano

The people of the island of Engano, who are Malay in type, are muscular and well-built, though short; but they are neither long-lived nor healthy, so that the race is rapidly decreasing, and the natives only numbered 329 in 1914 apart from the settlers on the island. This state of affairs is probably due to lax morals, internecine warfare, and disease. Although the island was the first place to be reached by the Dutch in the archipelago, it is still outside their rule, and is only occasionally visited by officials from Benkulen. There are a certain number of Chinese and Malay traders on the coast, where they are much mixed with the natives, with whom they barter tobacco, materials, &c., for forest products.

The inland Enganese were, up to a few years ago, an entirely uncivilized and naked people, but now they wear Malay clothing and occupy themselves in agriculture, fishing, and collecting forest products. They are a harmless, honest, and cleanly people, and gambling and opium-smoking are unknown amongst them. During recent years their curious houses, which looked like beehives perched on tall poles, have given place to the common Malay type of building. The people are pagans, but a mission-post is making many converts.

Riouw-Lingga Archipelago

The *Benua* or *Orang darat* of Rembang, Galang, and Batam, in the Riouw-Lingga Archipelago, who numbered about 1,000 in 1905, form the original population of this archipelago, where there are now large numbers of Chinese, Malays, and Buginese. The Chinese rule the entire economic and financial life of the

islands, and shipping, agriculture, and finance are largely in their hands. Some of the smaller islands are inhabited entirely by Malays and Buginese, the former living mostly in the small coastal villages, since they are less clever agriculturists than the Buginese. The *Benua* are an uncivilized and heathen people, leading a wandering life in the marshy woods, sheltering under roofs of boughs and leaves, and subsisting on the smaller forest animals and on rice, which they obtain by barter from the Chinese and Malay traders. They are a quiet and timid people, leading an independent existence ; though they speak Malay, in addition to their own language, they are quite different in type from the Malays, having round faces, with small noses, and low flat foreheads. Their hair is long and stiff, and they have a considerable growth of it on their bodies, so that the Malays call them *orang-utan*.

The chief town of the Riouw-Lingga Archipelago is Tanjong Pinang (population in 1905, 4,088).

Banka and Billiton

The *Orang darat* and *Orang gunong* are the indigenous people of the islands of Banka and Billiton. They are Malays of a very mixed origin, and of a low type, both physically and intellectually ; and though gentle and honest, they are apathetic, unintelligent, and weakly, and with hardly any industries of their own, and no love of work. Of late years they have collected in villages and live along the roads which join the tin-mines to the district capital, but agriculture is in a low state of development among them, and they take but a small part in the exploitation of the minerals of the islands, living largely by hunting and fishing, and by collecting forest products. Though they are submissive to their chiefs, they do not show them any particular respect, since there are no class distinctions among them. They are Mohammedans, though they still hold many pagan beliefs.

The chief town of Banka is Muntok (population in 1905, 4,699), and that of Billiton, Tanjong Pandan (4,900).

ORANG LAUT (SEA PEOPLE)

The name of *Orang laut* (sea people) is often used for all the fishermen of the archipelago who live mostly on the sea, but in

its narrow sense it refers particularly to the sea-faring race of the China Sea. These people are well-made and strong, and their hair is sometimes curly. They used to live entirely in their boats with their families, dogs, and cats, and they were redoubtable pirates ; but now many of them are peaceable and industrious fisher-folk, living on the coast in small houses standing in the water, and often working as wood-choppers or coolies when the weather is unpropitious, and taking to their boats to fish and collect tortoises, trepang, and agar-agar when it is fine. These ships, which have sails and masts, and are decked, are from 18 to 25 ft. long, with a beam of about 6 ft., and in them the *Orang laut* can make surprisingly long voyages ; each family possesses its own boat. Marriage with members of the same tribal family is forbidden. Justice is administered by the *batin* or chief, whose office is hereditary, but in most cases the people are under the rule of the local authority of the island which they make their head-quarters. They always journey in companies, and the members of a family are strongly attached to each other. Their clothes resemble those of the poorer Malays, and Malay is largely understood and spoken, but they use their own languages amongst themselves.

The *Orang laut* are found in Banka, Billiton, the Riouw-Lingga Archipelago, on the Sumatran east coast, &c., and in different parts they are known by different names and have varying characteristics. They have several settlements between the Reteh and the Kampas on the east coast of Sumatra, and in the Lingga Archipelago they live mostly in Dasi Strait and Limbong Bay, where they were estimated to number 750 in 1905. In Banka, where they are employed to transport tin and rice by water and to load ships, and are described as strong and clever workers, they are known as *Orang Rajat* in the Jebu district, and as *Orang Sekah* in the Blinju district and in Banka Strait. In the Karimon Islands, where they live in miserable little settlements on the muddy shore, they are known as *Orang Tambus*, and in Borneo and Celebes as *Orang Bajo*. In the north-west of Borneo they have settled on the coast, though they still live a wandering life in the north-east. In the settlement made between the pirates of Borneo and the Sultans of Beran and Bulungan, the Bajo were refused the islands of Derawan and Panjang and only allowed to settle in Buja Island to the south. In Celebes there are *Orang Bajo* on the Tomini Gulf, where they

trade in the Banggai Archipelago, in Bachian, and on the south-eastern peninsula. They are also found in Sumbawa, and on the islands off the north coast of Flores.

BORNEO

Population : Numbers

The people of Dutch Borneo may be divided into two classes : the Dayaks, an Indonesian people, who probably overwhelmed an indigenous Negrito race of whom no traces can be now found ; and the Malay and other settlers. Owing to the central position of the island, emigration of Malays from Sumatra, Buginese from Celebes, and Javanese from Java began in very early times, and the Dayak peoples have been pressed back into the interior on all sides by foreign settlers, who call themselves Malays, though the name represents a social and religious status rather than membership of any ethnic group. A large number of Chinese have been attracted to the south-west district by the search for gold, and have penetrated far into the interior, but though they intermarry with the people of the country, they preserve their own characteristics, and are constantly recruited by fresh arrivals of their fellow-countrymen. Though the pagan Dayaks live mostly in the interior, and there is a thriving population of Mohammedan Malays all round the coast, the population cannot be divided into Malay coastal peoples and natives of the inland country, since Malays have penetrated far up the navigable rivers of the island (which form the only useful means of communication), and in particular up the Barito ; in Sarawak there are conversely Dayaks living on the coast. The Malays are much mixed with the Dayaks by intermarriage, the children of such unions being always Malay and Mohammedan ; and Dayaks who are converted to Islam also always term themselves Malays, since the name of Davak is synonymous with head-hunting and paganism. The Malays are most numerous in the north and north-west, and in the south they have almost absorbed the Javanese, of whom there were at one time probably a considerable number. It is, in fact, only the Chinese, Arab, and Buginese settlers who have preserved their independent ethnological character.

Dutch Borneo, according to official returns, had about 1,572,460 inhabitants in 1912, of whom 1,127 were Europeans, 138,747

Chinese, and 4,580 Arabs and other foreign Orientals. This figure is probably, however, too small, and one authority gives the population of the whole of Borneo as 3,000,000. The greater part of Dutch Borneo, on the basis of the taxation figures, has only two or three people to the square mile, and it is only in Pontianak (population in 1905, 20,984) and Banjarmasin (16,708) and their neighbourhood that the population rises above forty or fifty per square mile. The first of these towns is the capital of West Borneo ; the second that of South and East Borneo. The other principal towns, with populations in 1905, are Sambas (12,096) in West Borneo, and Samarinda (4,733) and Martapura (4,298) in South and East Borneo. There are, in all, only thirteen towns with populations from 1,000 to 5,000. The people are mostly settled on the big rivers and their tributaries, separated in the interior by uninhabited stretches of forest.

Dayaks

The Dayaks are divided into a complexity of tribes, speaking different languages, and forming distinct political units ; they differ also largely in development, since some live a wandering life like the Kubus of Sumatra, whilst others are almost as civilized as the Malays. They may be divided into the Kayan group (comprising most of the tribes of Central Borneo), the tribes of the south-east, the tribes of the west, and the nomad tribes. The chief peoples of the first group are the Kayans on the Mendalam and the Upper Rejang ; the Bahaus, on the Middle and Upper Mahakkan ; the Kenijas, in the interior of Kutei and on the Upper Baram ; the Kinyins in the interior of Bulungan. All these tribes come from the basin of the Kayan River (the Apu Kayan or Po Kejin), and have established themselves on the different rivers which they now inhabit, mixing with the tribes already settled there ; they mostly form their names by prefixing the syllable *ma* to the name of their river.

The general name of *Ulu-Ngaju* (highlanders) which is applied to the tribes of the second group, the people of the south and east of Borneo, is inappropriate for the people living on the lower course of the rivers. Among these tribes mention may be made of the Biajus (on the Barito and in Buntok), the Ot-Danom (on the Upper Kahayan, Kapuas, and Barito), and the Olan-Maangan (also in Buntok). There is no general name for the many tribes

of the west, among whom the chief are the Embaluk Dayaks (on the Upper Kapuas), the Ulu Ajer Dayaks (on the Upper Melawi), the Sekadau Dayaks, and Ribuns (in Sanggau and Sekadau) the Desa Dayaks, who are thought to be descended from Hindu-Javanese colonists (in Tajan), the Manyuke Dayaks (in Landak). The people of the last two groups are far less warlike and energetic than those of the first group, the Kayan peoples, at whose hands they have suffered much in the past. The finest people of the country physically are the Kenyas, but the Kayans are the more skilled in handicrafts. In addition to the settled tribes, small groups of nomad peoples are to be found in all parts of Borneo, living a wandering life in the forests, of whom the chief are the Punans of Central Borneo and Sarawak.

The Dayaks differ considerably in physique, but on the whole they are a well-built people, and differ little from the Malays, except that they are somewhat taller, lighter in colour, and more active. The black hair is as a rule smooth or wavy, curly hair being an exception; the skin brown or dark yellow, the eyes bright, the nose flat but not broad, and the mouth and lips comparatively thin and small. Especially in youth, their features are often well-formed. Generally speaking, they are pleasant, hospitable, honest, and frank. They are temperate and cleanly in their persons, kind to their children and thoughtful for their companions, and in spite of the head-hunting which formed, or forms, a part of their religion, they are not as a rule brave or warlike. On the whole their morality is higher than that of the Malay settlers, who have had a distinctly deleterious effect on the Dayaks, though the low state of morality and the excessive indulgence at religious feasts noticeable among the tribes of the Upper Barito and Upper Melawi cannot be put down wholly to Malay influence. In these respects the Kayan peoples stand on a much higher level. The Dayaks are usually very conservative, and lack energy and self-confidence, but they are intelligent and artistic, and they learn foreign tongues with ease. There are a number of government schools in Dutch Borneo, but the advantages of education are not, as yet, much appreciated.

Dayak clothing is simple, consisting usually of a loin-cloth, with a small rattan mat hanging down at the back, and a band of plaited rattan round the head, for the men, and a coat and large hat for outdoor use. The women wear a short skirt with a *slendang*, or a coat and a hat like the men. None of the people

now go naked. The native material made of bark is now being superseded by imported cotton material. Both men and women wear old and valuable beads of agate, gold, or pearl, and many bracelets, ankle-rings, and earrings, the ear-lobes being often enormously distended by the wearing of heavy rings, or by discs of iron or wood covered with gold.

Tattooing is very common, particularly among the Kayans (though some tribes who have adopted Malay clothing have given up the practice), and the teeth are usually filed and decorated with pegs of gold or copper. The chief weapons are the sword, spear, shield, and blow-pipe; the sword and spear are always carried, being used for all sorts of purposes, now that warfare is more or less a thing of the past, and the blow-pipe is mostly employed for hunting. The weapons are finely carved.

All the Dayak houses stand on piles; where they have been particularly liable to attack, they are often raised very high above the ground, and they are always of great length, providing a home for as many as forty or fifty related families. The most common type, that of the Kayans, is divided along its length, with a common gallery where the young men sleep on one side, and separate rooms on the other, the central room in which the chief lives being the largest. A row of heads hangs in the gallery, which really forms the village street, and where all sorts of household goods are kept. Among the Long-Glat tribe on the Upper Mahakkan the houses are built on two floors, and the chief lives in a separate building. The houses of the Ot-Danoms have often a central passage, with a common room at the end and the separate hearths on each side, and are surrounded with an ironwood palisade, as are also the Biaju houses, which are divided like those of the Kayans, but have a central passage in addition. Each house has also a raft on the river for use as a landing-stage and washing-place. Among the tribes of the west, who have been much oppressed by the Malays, the houses are not so large and fine as among the Kayans and Kenyas, and when they are large, as among the tribes on the Kapuas, they are often made of inferior materials: since the houses are only inhabited for a few years (not more than ten or twelve), and are moved as soon as the fertility of the ground is exhausted, or owing to long-continued sickness or a series of misfortunes, bamboo and palm-leaves are often used in their construction. The Bahaus and

Kenyas, however, use hard wood by preference, and their houses are strongly built and decorated with carving.

These long houses, one of which often forms a whole village, are built near to and facing a river, which is largely used for purposes of communication. (The Sanggau Dayaks, whose houses are built on a different plan to those of the other tribes, form an exception to this rule). Scaffolding for drying rice stands near the house, and, among the tribes of the Upper Barito, a *balé* or council-house, where strangers are lodged and meetings held; among the Bahaus the gallery of the chief's house is used for such purposes. The villages of the south and east of the island are surrounded with palisades, and in the season when agricultural operations are carried on the people often live in temporary huts in their fields.

The Dayaks have no political divisions except the tribe, which may consist of the inhabitants of one communal house or of the several houses in one settlement, and vary in number from about one hundred to three hundred persons. In some parts smaller tribes are subject to larger, as in Apu Kayan and among the Long-Glats on the Mahakkan, and occasionally the villages are only territorial units, inhabited by members of different tribes. The office of chief is rather elective than hereditary, but in practice a son or daughter of the old chief usually succeeds him. A chief is responsible for the observance of the *adat*, entertains strangers, looks after the slaves, who are the property of the tribe, and administers justice, in which he is assisted by the most respected men of the community. Among the Kayan peoples the chief has a higher position, and the division of the people into three classes—chiefs of the families, common people, and slaves—is more important than among other tribes, where the tribal divisions are not strongly marked, and the chiefs have as a rule little power. A sharp distinction exists in the Melawi valley between the tribes who are independent and those who have been for a long period under Malay rule, and have lost their characteristic institutions. Slavery still exists in the parts of the country where Dutch rule has not yet been firmly established, but the slaves are, on the whole, very well treated, and are usually able to buy their own freedom, though cases of the sacrifice of a slave on the death of a notable man are still known.

Agriculture is the chief means of livelihood among all the settled Dayaks, each tribe having a definite section of land for

its own use, but rice-cultivation, which is bound up with the religious institutions, and has many religious feasts, prohibitions, and duties connected with it, is at a very low state of development, wet rice fields being found only near the coast. Women take a large part in agricultural operations and the religious ceremonies connected with them. Sugar-cane, potatoes, and tobacco are also grown, and fishing and the collection of forest produce are both important as means of livelihood. There is no trade among members of a tribe, but a considerable commerce in local and forest products with other tribes and foreign traders, largely carried on by barter, though money is coming into use ; long journeys are made by the natives to get beads, which are much valued both as ornaments and as currency, in exchange for their goods. Brass gongs, which are also largely used as currency, and large glazed pots and jars, which are believed to bring luck and keep away illness, are much prized. Industry consists almost entirely in the manufacture of articles for home use. Fine boats are built, the war-boats being about a hundred feet long. All the people are very clever iron-workers, each village having its own smith to smelt the iron. Clothes are made and decorated with beads, and mats and hats are plaited in every house ; and high artistic feeling is shown in the decoration of all the utensils of daily life with carving in wood or bone, bead work, &c.

The Dayaks are as a rule monogamous, though chiefs who have come under Mohammedan influence have often more than one wife. Except that a union with near relatives is forbidden, there are no special prohibitions concerning marriage, but a man marries by preference a woman of his own tribe and class, and if he marries a slave, he often has to take a slave's obligations on himself. The social system is patriarchal, though matriarchal customs, such as the residence of a man for some time after his marriage with his wife's people, are common, especially among the Manyuke Dayaks. A dowry is paid for a wife, but the position of women is very high, and they are treated as the men's equals. It is a matter of arrangement and convenience whether a married couple live with the wife's or the husband's people, and marriage does not involve community of goods. Divorce can be obtained by either party, and daughters and sons inherit equally from both their parents. Though morality among the young people is not at all high, married couples are very faithful to each other.

The great majority of the Dayaks are pagans, and among those

who have become Mohammedans, the knowledge and practice of their religion is small. Their animistic religion consists in the honouring of a large number of spirits, and good and evil omens, usually drawn from observing sacred birds, play a great part in their life, whilst the Bahaus have an highly organized system of augury and soothsaying. The Dayaks have all a powerful system of prohibitions (*pemali*), designed to ward off evil influences, and they come into contact with the world of spirits through their priests and priestesses, whose help is sought in illness and misfortune, and also at the agricultural feasts and the ceremonies connected with burial. They are usually highly honoured, as people of virtuous life who have undergone a period of trial and education for their work, but among the tribes on the Barito both the priests and priestesses are people of immoral habits.

A special part in the Dayak religious and social life is played by human heads, a head, preferably a fresh one, being necessary for a funeral ceremony, whilst a head is a possession much desired by every bridegroom or principal member of a family. Where the spread of European influence has put a stop to head-hunting, an old head is borrowed from a neighbouring tribe for ceremonial purposes.

There are about 7,000 Christian Dayaks, who usually live in separate houses and are more advanced in the practice of agriculture than the pagan peoples.

The Dayak languages, which are as yet little known, are very numerous, neighbouring villages frequently speaking entirely different dialects ; for this reason the natives can usually speak two or more different languages, and, since the recent spread of trade, a simplified form of Malay has been rapidly establishing itself as a *lingua franca*. The best-known language of Dutch Borneo is that of the Ngaju Dayaks in the south and east division of the island. None of the Dayak tribes has evolved a script of its own, as several of the Sumatran peoples have.

Since the nomad peoples of Borneo differ considerably from the settled tribes, a few words may be said about them in conclusion. The Punans and allied tribes are extraordinarily shy and timid, and live hidden in the forest in groups of some twenty or thirty people, spending only a few weeks or months in one spot, to which they are attracted by the presence of wild sago, though they usually confine themselves to a particular area, and trade and sometimes intermarry with the settled people of the

country. They live on the produce of the forest, and by hunting and fishing, and they have few industries, obtaining cloth and weapons by barter from other tribes. The Punans are physically a fine, light-skinned people, who never seem to suffer from the skin-diseases which disfigure many of the settled tribes. They are an innocent and harmless folk, who have all sorts of conservative prejudices, but absorb the customs and words of any tribe with which they come into contact, the culture of the settled peoples being much superior to their own. Divorce and polygamy are unknown, though polyandry occurs occasionally, and a man joins his wife's community on marriage. Their religious beliefs are similar to those of the Kayans, but less elaborate; unlike the other peoples of Borneo, they have no burial ceremonial.

KARIMATA ISLANDS

The Karimata Islands, which lie off the west coast of Borneo, are peopled with settlers from Lingga and Siak, who are occupied in fishing and in working the iron found on Great Karimata.

CELEBES

Population : Numbers

Celebes, which lies outside the old trade routes of the archipelago, was largely unvisited up to the middle of last century, and it is only of late years that any regular settlements have been formed and civilization introduced outside the districts of Minahasa and Makassar. Estimates of the numbers of the population are still therefore conjectural, the total for the whole island being estimated at about 4,700,000 in the official figures for 1914, and at 2,700,000 in the *Encyclopaedie van Nederlandsch-Indië* (1917 edition). The population is very unevenly distributed, about two-thirds of the island being almost uninhabited, though in Minahasa in the north, with 200,000 inhabitants, there are 105 people to the square mile, and in the island of Saleier 245. The whole of the Menado residency averages only about 30 people to the square mile, and that of Celebes and dependencies about 37. In general the coasts of the island are fairly well populated, but the tribes of central Celebes are separated by large uninhabited stretches of mountainous country, their settlements lying in the river valleys and on isolated plateaux. In south Celebes, owing

to the mountainous interior and for purposes of trade, the settlements are mostly on the coast and at the mouths of the rivers, whilst in Minahasa the people live in the valleys and on the lakes. In 1905 there were three towns in Celebes with a population of over 10,000 : Makassar (26,145), Menado (10,344), and Tondano (10,592) ; with only nine other towns having a population of between 1,000 and 6,000.

Native Peoples

The native peoples are members of the Malayo-Polynesian family (with the exception of the Toalas, who are thought to be a remnant of the aboriginal inhabitants). Excepting the Minahasese, who are of a completely different type, they are probably all of one race, sometimes called the Toraja, and resemble one another closely in language and appearance. The name Toraja (which is that of a tribe of west central Celebes), is, however, usually applied to the tribes of central, south-eastern, and eastern Celebes, who are still largely pagan, as distinct from the more civilized and Mohammedan peoples, chief among whom are the Buginese and Makassars of the southern peninsula, whose states are monarchical, while the pagan Toraja still live under the patriarchal system. To this category also belong the Islamized Mandars on the west coast of Central Celebes, the people of the small countries of Parigi and Kaili, states of North Celebes such as Gorontalo, and of the kingdom of Bolang-Mongondu. The coastal population is much mixed with Buginese and Makassars, and other elements are formed by the Bajo, the 'sea-gypsies' (see under *Orang Laut*, p. 187) and by the Arab and Chinese traders, who marry native wives. These, however, are few in number, as compared with other parts of the archipelago, since there were only 11,862 Chinese and 1,207 Arabs in the island in 1905, mostly living, like the 2,836 Europeans, in the trading settlements. The name of Alfurs is also used for the pagan and pig-eating tribes, as distinct from the Mohammedans, and has no geographical significance, since it is applied also to the undeveloped peoples of the Moluccas.

Toraja Tribes

Though the Toraja tribes—i. e. the people of central, south-east, and east Celebes—differ in development, owing to their

separation into isolated groups, and also probably to the varying admixture of Toala blood, the likeness between them is marked.

The Toraja tribes may be divided as follows. It is impossible as yet to give a complete list of all the different tribes, so that an attempt has only been made to mention the more important and better-known among them.

(a) *Mountain Torajas*, including (1) Parigi¹ and Kailis ; (2) Tokulawi, Tosigi, Tolindu ; (3) Totawaelia, Tonapu, Tobada, &c.

(b) *Lowland Torajas* (Barée-speaking), including Toondae, Tolage, Topebato, Tolampu, &c.

(c) *Sadang group*, including Toleboni, Torirampi.

(d) *Tribes of South-eastern Peninsula*, including Tomekongka, Tololaki, &c.

(e) *Tribes of West Centre*, including Toraja, Torontjong, &c.

(f) *Tribes of North Centre*.

The tribes, which usually form their name by adding the syllable *To* to the name of their chief village, frequently split up and form new communities, but the whole of the Toraja country is very thinly peopled, partly owing to the insanitary conditions of life, and partly to the constant wars of the past. The Toraja are not a strong race, since the continual shortage of food lessens their power of resistance to disease, and the dirty condition of their persons and their houses, where children, pigs, and fowls all run about together, causes a large incidence of head and eye diseases. Very old people are seldom seen, the natives being helpless against epidemics, and infant mortality, owing to the heavy labour undertaken by the women, is high. Raids and head-hunting had probably a comparatively insignificant effect on the numbers of the people, but the continual state of unrest in the country before the establishment of Dutch rule has prevented the natives in the past from applying themselves to agriculture, and the villages were usually built on the hill-tops, with an eye to defence, where they were much exposed to wind and weather, and where the ground was unsuitable for *sawah* (wet) rice cultivation. The early age at which young men and girls come together, and the frequent absence of the married men in the past, seeking forest products or head-hunting, had also a deleterious effect on the birth-rate. These conditions, however, are rapidly changing under the Dutch, who have instituted far-reaching reforms.

The mountain peoples are as a rule more strongly built, with more prominent cheek-bones, thinner lips, and smaller eyes than

those of the plains; they are more independent and secretive, and less honest than the Barée-speaking peoples (lowlanders), and consider themselves a superior race. The Toraja have large mouths and thick lips, and the nose is usually broad, though among the Tobada it is of a more European type; the skin varies from light to dark brown, and the black hair, which is worn long, is usually smooth. The Toraja are on the whole an innocent and guileless race, friendly, courteous, good-tempered, and easily managed by those whom they trust, though, like most uncivilized people, they are revengeful, and human sacrifices were common up to late years. They are naturally lazy, though the women are more industrious than the men, often keeping the family from need by their work. The Toraja are primarily agriculturists. Industries are few, and consist mainly in plaiting, pottery making, wood-carving, and working in iron.

Clothing of prepared bark is still commonly worn, though it is being replaced by garments of European material where there is communication with the coast; in Bada the bark clothing is finely decorated. Many ornaments—earrings, ankle-rings, and bracelets—are worn, and the teeth are commonly filed, the front teeth being completely sawn away or extracted among the Tokulawi.

Toraja society is very simply organized. A wife is usually chosen from another branch of a man's own family, so that each tribe is really one large family, each village representing a separate branch, and there are no social distinctions and no tribal chiefs. Such a society is naturally ruled more by custom than by direct government. The man is head of the family, though a bridegroom lives for a stated period after marriage with his wife's people, and the women take a comparatively high position, usually choosing their own husband.

The Toraja tribes are mostly pagan, believing in many good and evil spirits, and honouring the souls of the dead, though the Parigis on Tomini Gulf and the Kailis on Palu Gulf are largely Mohammedan, and in some places, such as Mambre and Masamba in central Celebes, and in the south-eastern peninsula, the influence of the Mohammedan coastal population has led them to give up the use of pig-flesh as food. The older settlements, which were built in as inaccessible positions as possible, are often fortified like the Batak villages, with earthen walls and bamboo palisades, and the houses—unpretentious buildings standing on massive piles, often decorated with carved and coloured work—

have strong walls, thick roofs of *atap*, and small entrances. They usually house four to six families, and consist of a central apartment with a hearth and several smaller rooms; strongly built barns for storing the harvest are found in most of the villages. Of late years, however, the Dutch Government has compelled the people to inhabit new villages, which have been built along the rivers or on the chief line of communication through their country, where the land is more suitable for *sawah* rice cultivation. In these new villages the houses, which are all of the same pattern, are built in neat rows, each standing in its own garden, instead of being clustered together as in the hill-top settlements. The natives were at first very hostile to this ordinance, which drove them from their villages and temples, to which they were much attached, particularly since the building of temples was no longer permitted as it was in them that the war-gods, the spirits of brave ancestors, were thought to live, and the heads brought back from raids were kept. Yet they have been quickly reconciled. The chief difficulty has been to make the village chiefs, whose duty was formerly only to ensure the observance of local customs, into efficient administrators of the much larger settlements which were now put under their charge. The prohibition of head-hunting and of divination by spear-throwing and other methods has caused much irritation, since heads are regarded as a potent means of healing, and all sorts of questions and disputes were formerly solved by augury and sorcery. In order to pay the taxation imposed by the Dutch, the natives find it necessary to go out to collect forest products, but to minimize the possible evils of a wandering life, only half the men are allowed to leave their village at once, and they must not be absent for longer than two months; all that they bring is handed over to traders appointed to collect the produce and recruit labour. By means of statute labour for four days in each month, well kept roads have been built through the interior of Celebes and schools have been started, where reading, writing, arithmetic, agriculture, and Christianity are taught by teachers from Minahasa. These schools have been well received by the natives, and there were sixty-nine in the Government of Celebes and Dependencies in 1913. Slaves, who were formerly very numerous and formed a separate class, have been free since 1906, and though conditions naturally change but slowly, they are now allowed to marry free women and to send their children to school.

Many dialects are in use among the different tribes, who cannot as a rule speak any language but their own, though that of Palu is largely used as a *lingua franca* in central Celebes.

Buginese and Makassars

The Buginese and Makassars are two nearly-related peoples differing slightly in manners and customs ; they are probably descended from Toraja tribes who came into touch with the Hindu culture of Java, owing to their position in the south of Celebes, and were later converted to Mohammedanism, which is now also spreading among the other peoples of Celebes. Both the Buginese and Makassars, the former more markedly than the latter, are seafaring and trading peoples, who have carried their wares and their culture all over the archipelago, while preserving their own language and customs. The Makassar country forms a broad belt to the west of the end of the southern peninsula, and the Buginese inhabit the rest of southern Celebes, but Buginese are settled in many parts of the coasts of Celebes, as well as in Borneo and other parts of the archipelago. They are the founders and rulers of most of the principal towns of Celebes, and it is often difficult to distinguish them from those natives of the centre of the island who have become Islamized, and to whom they are related by inter-marriage. The numerous Buginese and Makassars of the south-eastern peninsula, who were formerly exceedingly prosperous traders owing to the plentiful supply of slave-labour and the absence of competition, have had a less easy existence since the establishment of Dutch rule there, and the suppression of slavery.

The Buginese and Makassars are well built, with a light skin. They have long borne a bad character as thieves and murderers, probably largely as a result of the misgovernment under which they have suffered, and they are still intent on making a livelihood with the least possible trouble, and are not particular as to the means employed. They are far more energetic than most Malays, but like other Malay peoples they are proud, vindictive, and passionate, and devoted to gambling and cock-fighting. Many public feasts are given, and dancing and the music of the native orchestras are popular.

By religion the Buginese and Makassars are Mohammedans, but they are by no means orthodox or fanatical, and the pagan priests and priestesses are said still to have considerable authority.

The state organization is monarchical and feudal, and the people are divided into the princely class and the common people : the slaves formerly made a third class, and though slavery is now suppressed, it will be some time before its roots in native society are eradicated.

The villages are small, and were formerly very untidy and dirty, but under Dutch rule they have been much improved ; communicating roads and paths have been made, and the houses arranged in rows : the natives have been forced to put in order the impassable jungle of trees and weeds which surrounded their houses, and have been forbidden to use the space under the buildings as a stable. Each village has its mosque. The houses are built of wood or bamboo on piles, the steps leading up to a sort of porch. Both furniture and clothing are very simple. Marriages are usually arranged by the parents, social position being an important consideration, and a comparatively large sum of money being usually paid by the bridegroom. Exogamic and endogamic weddings are allowed, but the union of a woman of high rank with a man in an inferior position is disliked. There are various survivals of the matriarchate ; half the children belong to, and inherit from, the mother, and half from the father, and when a man marries a woman of lower social position than himself, which is a common occurrence, only half the children inherit his status. Women hold a high place, and take part in public life. Married couples live sometimes with the wife's relatives, and sometimes with those of the husband, and each has his or her own possessions, though in the towns the Mohammedan law of inheritance is coming more and more into use. Divorce, by either party, is common and easy.

The Buginese and Makassars are temperate and abstemious : their chief foods are rice and maize, with fish and spices, buffalo meat being only eaten on festive occasions. Industry is not highly developed, but weaving is largely carried on ; *sarongs* of fine material are made in many parts, and are exported in large numbers from Mandar. Plaited goods are made everywhere for local use, especially beautiful and varied work of this kind being done in Boni. The best gold and silversmiths are found in Makassar, Gowa, Mandar, and Boni, ironworkers in Luwu, Laiwui, and Mandar, and shipbuilders in Pambauwang, Bira Regency, and other places. Here and there the people

make a good profit by collecting forest products. Buffaloes, cattle, and horses are kept, but are not well cared for ; hunting and fishing, which are largely engaged in for pleasure, provide an abundant means of livelihood for many people. The old-established sea traffic of the Buginese is still important, in spite of steamship competition.

All uncultivated ground is owned by the district, with the rights of hunting, wood chopping, &c., each man possessing the land he clears and cultivates, though the district keeps the sovereign right, and can alienate a man's produce from him if he does not fulfil his duties to the prince or the community.

The Buginese have a peculiar written alphabet, which is used also by the Makassars, by some tribes of northern Celebes, and by the people of Sumbawa, and they have also a calendar of their own.

Minahasese

The people of Minahasa, in the north-east of Celebes, who are an intelligent race, and have been found eminently capable of development, are quite distinct in type from the other inhabitants of Celebes, and it has been suggested that they have a strain of Japanese or even European blood : the skin is very light, lighter than that of any other people in the archipelago (especially among the women, who have red cheeks and lips), the nose is high, the lips prominent, and the eyes widely separated. The hair, which is black and stiff, is now usually worn short, and the features are pleasant, though rather heavy. The people are on the whole taller and stronger than the other inhabitants of Celebes. They are divided into four chief tribes : the Toumbulu (in Menado and Tomohon), the Tounsea (in the Klabat peninsula, Ajermadidi and Kema), the Toulour or Tondano (round Tondano Lake), and the Toumpakewa (in Sonder, Lagowan, and Amurang). There are also the more divergent Bantiks, on the coast north of Menado, and the people of the south-western part of the country. Eight different dialects are spoken among the various tribes. The inhabitants of the islands of Siau and Sangi are closely related to the Minahasese, and it is probable that they all form part of an immigrant race from the north, who settled in the Philippines, the north of Celebes, and various smaller islands.

In spite of the very small size of their country the Minahasese

number about 200,000, but the land is not over-populated, as in Java, and the people are prosperous. Minahasese society is aristocratic, and the chiefs of the Dutch administrative divisions are descended from the old noble families. They were formerly a warlike race, constantly engaged in raids and head-hunting, but a complete change has been worked, Minahasa having come into touch with European influence earlier than any other part of Celebes; and peace and safety rule. Each village has its church and school. European clothes, materials, and sewing machines are in use everywhere.

Except for a small number living mostly in the south-west, the whole country is Christian, and it is only misfortunes, such as cholera epidemics, which bring forgotten remains of old beliefs to light. This Europeanization of Minahasa was all carried out in some seventy or eighty years, owing to the sympathetic co-operation of the natives themselves, many of whom now make use of the Dutch law which enables them to obtain a civic status, and to put themselves on an equal footing with Europeans. In Java they compete successfully with the Eurasians as government clerks.

Gorontalese

The Gorontalese, who live in the western part of the north-eastern peninsula, are members of the Toraja family, and are thus not related to the Minahasese, but they are largely Moham-medan, and an increasing number make the pilgrimage to Mecca. They are thought to number about 125,000, including the Buginese, Makassars, &c., living in the country, and are a short, smooth-haired, and rather light-skinned people: the inland tribes differ from those on the coast. Rice, maize, coco-nuts, tobacco, &c., are grown, but agriculture is not highly developed. There is a lively trade in forest products from the interior, and weaving and plaiting are carried on, some of the most beautiful materials made in Celebes coming from Buol. The mines were formerly worked by statute labour, but now no natives are in a position to carry on the undertaking. The Gorontalese do not seem a strong people, and they are much given over to sexual indulgence. Polygamy is general, since women are more numerous than men. The people are good-tempered but indolent. Different dialects are used, but all resemble each other closely.

Toala

The existence of an indigenous people in Celebes, who have been superseded by the Toraja, is a matter which is still uncertain: there are, however, in different parts of the island groups of undeveloped and uncivilized people who differ from the Toraja in type, and have apparently in most cases been enslaved and crushed almost out of existence by them. The Toala of Lamontyong, and the Tokea and Tomuna of the south-eastern peninsula are thought to be remains of these aborigines, though the Tokea have a large admixture of Toraja blood. Many tales of wild or invisible men are told by the Toraja tribes, and there are apparently men living in the woods in north Celebes, too shy ever to show themselves, so that it is possible that similar wild tribes exist in other parts of the island; short people, of Toala type, with more or less curly hair, are met with also among various Toraja tribes, particularly the Tolage and Tondae, who kept of old the largest number of slaves, and these people may well represent the aboriginal inhabitants. The Toala and Tomuna, who have been enslaved by the Buginese, are a very short people, much darker in colour than their neighbours, the Tomekongka: the nose is broad and flat, the mouth prominent and chin receding, the hair wavy or curly. They have a distinct language of their own, and are a quiet, good-tempered people.

SANGI ISLANDS

The Sangi Islands, which are very thickly peopled, have a total population of about 107,000—60,000 in Sangi, 40,000 in Siau, and 7,000 in Tanguandang. The people live by agriculture and fishing; there is a considerable trade in wood and copra, and nutmeg is cultivated. Weaving and plaiting, which were formerly carried on by the women on a large scale, are dying out, owing to the import of European material. The natives are now prosperous, and live a peaceful life under Dutch rule, though up to recent years the islands were terrorized by the pirates of Sulu. They are mostly Christians, as there are a number of missionaries living among them. Society is based on the matriarchal system, and the natives, who speak a language of their own, are related to the people of Minahasa and of the Philippines (see under Minahasese, p. 202).

BANGGAI ISLANDS

The chief inhabited islands of the Banggai group are Banggai itself, Peleng, Labobo, and Bangkulu. The coastal population is largely Mohammedan, but there are a number of pagan tribes living in the interior of Banggai and Peleng, who differ in little but religion from the Moslem inhabitants. The pagan peoples live largely by agriculture, and the Mohammedans by fishing. The people are poor, and live in wretched wooden houses.

SALEIER

The island of Saleier is one of the most thickly populated parts of the administrative division of Celebes ; in 1905 it had a population of 75,000, living largely in the western and flatter part, and including Makassars, Buginese, and Malays, with a number of Chinese in Padang, the capital. The people are Mohammedans.

MOLUCCAS

Population : Numbers

The Moluccas, in which are included the two residencies of Ternate and Amboina, have been for centuries a centre of trade, and the coastal population is in consequence so mixed that it is difficult to disentangle the strains of Buginese and Makassar, Javanese and Malay, Portuguese and Dutch blood, which are mingled with that of the indigenous peoples of the islands. Of the western nations the Portuguese have left the most lasting impression on languages and customs, and there are still many traces of Portuguese influence. It is thus only in the centre of the islands that the natives still live in their primitive condition ; on the coast they have frequently intermarried with the settlers, and become Islamized, since the influence of strangers had led to the widespread adoption of Mohammedanism, except in the interior, where the people are still pagan, and in Amboina, which is largely Christian. The old religion, however, lies very near the surface.

The climate of the Moluccas is healthy, and the soil is fertile, but the islands are very thinly peopled, Ternate having only about eight people to the square mile, and Amboina thirteen. The scattered population are content to live on the easily-gotten natural products of the land, without working to produce

and market goods, and the almost universal presence of the sago-palm renders unnecessary the energetic cultivation of the soil and the raising of a rice harvest, which forms the chief occupation of most of the peoples of the archipelago. Trade is still carried on by barter in the interior of many islands, and industry is unimportant, though fisheries, and especially pearl-fishing, are carried on in many parts.

In 1912 there were 325,934 people in the Amboina Residency, and 160,135 in the Ternate Residency (including the population of Merauke, South New Guinea). There were altogether 3,658 Europeans, 2,457 Chinese, and 1,735 other foreign Orientals. Japanese are less numerous than in other parts of the archipelago, but there are settlements of Japanese prostitutes in many of the trading communities. The largest towns are Amboina (8,328), Banda Neira (4,130), and Ternate (3,616), whilst Wahai (in Ceram), Labuka (on Bachian), Saparua (on Saparua), and Patani (on Halmahera), have between one and three thousand inhabitants.

The pagan peoples of the interior of the islands who are called Alfurs, which is equivalent to 'savages', form a link between the Papuans and the Malayo-Polynesian peoples of the rest of the archipelago, since the proximity of the islands to New Guinea has resulted in an admixture of Papuan blood, particularly in the southern islands. Separation on separate islands, and contact with varying foreign influences, has so changed the languages of the Alfurs that it is difficult now to trace any resemblance between them.

Halmaheira, with Morotai

Halmaheira or Gilolo had a population of about 30,000 in 1905, of whom about one-sixth lived in the part of the island belonging to the Sultanate of Tidore, and as a result of propaganda by fanatical princes these people are all Mohammedans, though in the Ternate division of the island the pagan Alfurs are in a large majority. No pressure is now brought to bear to induce them to change their religion, except in the case of an Alfur woman marrying a Mohammedan. That the new religion has not penetrated very deeply into the life of the people is shown by their adherence to their traditional customs, which are condoned by the priests. The northern peninsula is the most thickly populated part of the island.

The Alfurs of Halmaheira are probably more representative of the original type of the inhabitants of the Moluccas than those of any other island and their civilization is still rudimentary. They are neither Papuan nor Malay in type, having crisp, wavy hair, and a skin even lighter in colour than that of the average Malay: the men are strongly built and well made, and the women are thick set and ugly. They are modest and willing. They are true forest people, often building themselves huts of leaves and branches as a shelter for the night, and their dress usually consists only of a loin-cloth and a head-covering. They get their food and drink from the sago and the aren palm, and gain a livelihood by hunting, fishing, and agriculture. In clothes, houses, weapons, and customs the districts differ largely one from another, and though the languages in use are all dialects of the same tongue, they resemble each other so little that natives from places not far apart use Ternatan, which is commonly spoken on the coast, as a means of communication.

Head-hunting is a thing of the past, though murders from motives of revenge still occur; but the people are on the whole gentle, and lead moral lives. Their society is patriarchal, and marriage is exogamic. In religion they are pagans, worshipping the souls of the dead and evil spirits, whom they conciliate with offerings.

Trade is unimportant, and is mostly carried on by barter with Chinese and Makassars from Ternate, who make their way over the Dodinga Isthmus and the east coast: linen and finery are much in demand among the natives.

Morotai had in 1909 a population of about 4,200, of whom about 750 were Mohammedan and 300 Christian. The Alfur population collect forest products, as a rule spending about one week in four in the search, and living the rest of the time in idleness. The island is much visited by people from Galelo and Tobelo on Halmaheira, and also from northern Celebes, to cut sago and to fish: those from Galelo, who are the most numerous, confine themselves to the west and north, whilst the Tobelo natives go to the south-east of the island, many of their settlements being only temporary. The Galelo language is the most used.

Ternate, with Tidore, Makian, Kajoa, Taifore, Maitara, Mare

The people of Ternate, who numbered about 8,000 in 1905, are largely concentrated near the Sultan's palace and the town

of Ternate, which is now but a shadow of its former self, its trade being unimportant. All the well-to-do people live on the Sultan's lands. They are a mixed race, who differ little from many other related peoples of the archipelago, except that they have a language of their own, written in the Arabic character, which is used as a *lingua franca* in the Ternate Residency, the knowledge of it having been spread in earlier times by the soldiers of the Sultan sent to administer the islands under his rule. The Ternatans are all Mohammedans and burghers (see under Amboina, p. 214), and since they will not work except to provide themselves with absolute necessities, they are not over-prosperous: sago, fish, and vegetables form the chief part of their food, most of the island being covered with forest. Various amusements, such as fighting with bamboos, dancing, and the recitation of poems, are popular.

The people of Tidore, who numbered 9,624 in 1905, resemble those of Ternate in religion, appearance, language, and customs, but they are even worse workers, lazier and more careless. They buy all their household goods in Ternate, selling their garden produce and fish in exchange, and many natives of Tidore travel round the islands with travelling smithies, mending cutlery and weapons.

Mention may here be made of the following neighbouring islands: Makian, Kajoa, Maitara, Taifore, Mare.

Makian had a population of about 8,000 in 1905. The people, who are Mohammedans, are hard-working, and are engaged in weaving, fishing, and tobacco cultivation. The soil is unfertile, and neither sago nor coco-nut palms grow on the island, so that sago, which forms the daily food, is imported from Halmahera. The houses, which are solidly built, are surrounded by fruit trees, and sugar-cane, maize, *pisang*, and a little rice are grown in the gardens. In dress and customs the people do not differ much from those of Ternate.

People from Makian, Ternate, and Tidore have gardens on Moti, and there is a place of sacrifice on the summit of the island, but there is no settled population. The people of Kajoa who are Mohammedans are related to those of Makian, and speak the same language. They live by fishing and by growing rice on Waidoba Island, which often fails, however, owing to careless cultivation. People from Makian have gardens on the northern coast.

Maitara is inhabited by Tidorese, who go there for the sake of the coco-nuts, which do not grow on Tidore, and earthenware is much manufactured on Mare from the clay found there. Taifore is uninhabited, but is used as a place of call by Sangirese trading at Ternate.

Bachian and Obi Islands

In 1909 the total population of these groups was 9,021 : 6,166 on Bachian, 1,044 on Great Obi, and the rest on the smaller islands. This population is floating, and only about 1,300 of the people of Bachian are indigenous, the remainder being natives of Ternate, Tidore, Buton, Java, and the Talauer Islands. The people are divided into three classes, the relatives of the former and present sultans, the district heads, and the common people. The natives are supposed to have come originally from Halmahera, like those of Ternate and Tidore : they live by cultivating land on a small scale, fishing, and making baskets. The Talauese and Javanese on the islands work as coolies for the Batjan (Bachian) Exploitation Company, whilst the people from Ternate and Tidore are largely employed in collecting forest products.

Bachian is now as somnolent as Ternate, and the capital Labuka, apart from its Sultan's residence, church, fort, and school, is only a collection of fishermen's huts. The island had formerly a language of its own, related to that of the Sula Islands and Banggai, but owing to the influx of Malay-speaking peoples it has become a mixed tongue.

The Obi Islands, unlike Bachian, have no indigenous population at all, but are much visited by people from Tidore, Bachian, Makian, &c., who fish for pearls, cut sago, and collect forest products, only staying in the islands and taking their trove to Labuka for sale. The islands, which are rendered difficult of approach by the surrounding coral reefs, were formerly a favourite haunt of pirates.

Sula Islands

The population of the Sula Islands is partly Mohammedan and partly Alfur : most of the pagan peoples live an isolated life in the interior of Taliabu, not owning the sovereignty of the Sultan. The chief products are rice, maize, and sago, maize being the chief food on Sula Besi, and sago on Taliapu and Man-

gole, while rice is used chiefly for the payment of taxes, for purposes of barter, and as a luxury for feasts: tobacco and sugar-cane are also grown, and the natives of Sulabesi weave *sarongs* from European yarns, plait mats and build boats. Sanana, which was formerly the haunt of pirates from the Obi Islands, is barely alive, despite its secure roadstead and the presence of a Dutch *posthouder*.

Buru, with Ambelau,

The indigenous Alfur people of Buru, living in the interior, seem to be nearly related to those of West Ceram. The coastal population is, as usual in the Moluccas, much mixed, and consists of people from Buton, the Sula Islands, Galela, Amboina, natives of Buru itself, and a few Chinese and Arabs. The population was estimated at some 13,000 in 1913, 6,000 pagans, 4,500 Mohammedans, and 2,500 Christians, but the latest reckoning gives the total as 20,000. The Christians live mostly in Masarete and to the west of Wa Mala on the south coast, and the Mohammedans in Kayeli and in some of the coastal villages.

The indigenous people of Buru are divided into sixteen tribes, each having a district of their own, though communities and even individuals often dwell outside the borders of their own tribe. Each tribe is divided into as many communities as the original founder had sons, and the office of chief of the tribe and of each family is inherited by the eldest son; but there is no true aristocratic class, since the family of a chief does not possess his rights and privileges. On the coast the natives and the foreign settlers have each their own ruler, so that there are often several chiefs in one village.

The natives of Buru, who are an Indonesian people, short but well built, are suspicious, untruthful, and lacking in energy and very dirty in their houses and their persons: they are, however, good-tempered and quiet. The women wear a *sarong* and a *kabaja* (a sort of long coat), and the men coat and trousers, except when engaged in exhausting work, when they revert to the loin-cloth. Their weapons are guns, lance, and *klewang*. The teeth are filed, and circumcision is practised.

The villages on the coast are larger than those of the interior, which lie very far apart and consist only of some five or six houses, standing round the *huma tita*, or place of lodgment for strangers.

Marriage is exogamic : considerable sums, provided by the man's community as a whole, are given for a wife, and till the whole sum is produced, the husband lives with his wife's people. Women are often betrothed as babies, marrying into their husband's tribe when they are of a suitable age. Polygamy is common, all the wives and their children living together, and adultery and elopements are frequent. In spite of these conditions, the women take an equal place with the men in daily life, if not superior to them.

The pagan people of Buru believe in a superior being, who is too great to concern himself with men, so that it is only the good and evil spirits, and the souls of the dead, who are honoured and invoked.

Agriculture is the chief means of subsistence, but is at a low state of development. The land is possessed by the family, all members having equal rights, and can never be sold to strangers. The coastal population, Mohammedan and Christian, live the same life as the pagan natives : a few villages in Masarete and on the south coast have coco-nut plantations, and the people on the north coast are largely occupied with the preparation of cajeput oil, but trade is mostly in the hands of a few Chinese and Arabs, and industry is little developed.

Four dialects are spoken in Buru, which are all related to Amboinese.

Ambelau has a Mohammedan population of some 1,300, who live by fishing and trading with neighbouring islands. Sago is imported from the south coast of Buru, where many natives of Ambelau possess woods of sago-palms and coco-nuts, and make many converts among the pagan peoples. The language is related to that of the Buru natives, but is not understood by them.

Ceram, with Ceram Laut and Goram Islands

Ceram, with a population of about 60,000, has, like other islands in the Moluccas, a coastal population compounded of people from Java, Makassar, Ternate, Ceram itself, and numerous other places, largely Christian and partly Mohammedan in religion. The Christian natives of the west (*Orang Serani*) have adopted the clothing and civilization of their neighbours, the Amboinese, to whom they are nearly related, and take pride in their religion and their social position. It is

thus only among the indigenous Alfurs of the interior that the type, dress, and customs native to the island are to be found. These natives, like those of Halmahera, form a link between the Malays and Papuans, and are a strong and muscular people, but owing to the smallpox epidemics of the past, and the present prevalence of fevers and head-diseases, and also to the low birth-rate (probably caused in some parts by the constant intermarriage in the tribe), they are decreasing in numbers. There are marked differences between the people of west Ceram and those of the rest of the island, and also between the various tribes. The natives of the west, who were once the most notorious head-hunters of the archipelago, are tall, proud, and fierce in appearance, while those of the centre and east are smaller, and far more peaceful in their ways. The people of Honitetu are particularly famed for their uncouth and riotous behaviour, but since 1910 the whole island has been quiet, and in 1914 the garrison at Wahai was withdrawn. The natives are willing, cheerful, and honest, but they are nervous, excitable, and prone to exaggeration: the western peoples are independent and liberty-loving, and drunkenness is extremely common among them, though rare in the rest of the island. Although Christianity may not go very deep, its results are seen in the peaceful and comparatively humane state of society, and in the cleanliness of the people. Christians and Mohammedans live quietly together: the number of the latter, who live chiefly on the south-east coast, is small, and since their religion is more a matter of custom than of conviction, they do not engage in propaganda. The natives are very quick to learn, and there were 68 native schools on the island in 1914.

The usual clothing is very simple. The chief weapons are bow and arrow, used in warfare, the *parang*, the lance (used for hunting), and a decorated shield for war-dances: most of the natives of the west also possess muzzle-loaders. The houses of the Christian and Mohammedan population are built on the ground, but those of the Alfurs stand on piles. The villages are never fortified. Pigs, dogs, and deer are kept, but no cattle. The people, who probably number some 65,000, are divided into tribes, who have not now districts of their own, though each tribe has a sphere in which it is paramount. The tribes of West Ceram are divided into two politico-religious parties, the *Pata-siwa* (the Ternate party), in the west, and the *Pata-lima* (the

Tidore party) in the east. The *Pata-siwa* are again divided into the *pata-siwa putih* and the *pata-siwa itam*, the latter being named after the blue tattooing on the chest which denoted membership of the secret society, the *Kakihan*, to which all the boys of the *pata-siwa itam* are elected at puberty. The priests of this society, which exists to maintain old usages in the face of foreign influence, had formerly a great influence, but Christians and Mohammedans are now seldom members, and have given up the practice of tattooing. The social system is patriarchal, and marriage is sometimes exogamic and sometimes endogamic; a dowry of from 50 to 150 guilders is paid for a bride. Women are on the whole well treated, and take a good position, and morality among the mountain peoples is at a high level.

The chief means of livelihood are hunting and fishing: agriculture, or rather garden-culture, takes quite a secondary position, and is entirely unmethodical, since the sago-palm, which provides the chief article of food (eaten with fish, meat, or spices) requires no care: the natives are remarkably indolent, but are clever woodsmen and hunters. Trade is in the hands of the Chinese, Makassars, and Arabs, who used to exploit the natives unmercifully. Of late years, however, since the knowledge of the value of money has become general, matters have improved.

Industry is unimportant: weaving and pottery-making are largely unknown, though in some parts to the south-east *sarongs* are made, and the only industries of the Alfurs of the interior are the manufacture of weapons and plaited goods. The houses and objects of daily use are seldom decorated, and the use of brickwork in a house was till recently forbidden, since it was reserved for the *kakihan* house, which stands in the forest. The chief riches of the natives consist in china plates and dishes, which are much valued. The people are extraordinarily fond of protracted ceremonial feasts. It is remarkable that this primitive race, without script or literature, possess their classical songs, which have been handed down since the war with the Company in 1652.

The religion of the pagan peoples consists largely, as in other islands, in the propitiation of evil spirits, the worship of dead ancestors, and the observance of a very extensive system of prohibitions (*pemali*). The people of East Ceram believe also

in a superior being, who is manifestly borrowed from the Mohammedan Allah.

About thirty-five different dialects are spoken in Ceram, so that neighbouring districts frequently cannot understand each other's speech. These languages are still little known, but are thought to be related to that of Amboina. Malay, mixed with native terms, is spoken on the coast.

The people of the Ceram Laut Islands, to the south-east of Ceram, who number about 6,000, are all Mohammedans: the villages, which are now tidy, and better built than formerly, lie mostly on the coastal plains. The people fish, build boats, and make knives, whilst the women weave remarkably fine *sarongs*. They speak the same language as is in use in the east of Ceram, and are grouped together under chiefs. The Goram Islands, to the south-east of the Ceram Laut group, have a Mohammedan population of some 6,000, who carry on a flourishing trade with the surrounding islands. The women are also famed for weaving.

Amboina, with the Uliassers, Manipa, and Boano

Europeans and Malays engaged in the spice trade have been established in Amboina for so many centuries that the island is notable for a much higher standard of civilization and comfort than obtains in most parts of the archipelago. The total population is about 40,000, almost entirely Christian in the south, and Mohammedan in the north. The town of Amboina (population 8,328) conserves some of its ancient prosperity, and is clean and well-built, whilst in some quarters the houses of the natives, and particularly of the chiefs, are as large and well-decorated as ever: the European dress and the ornaments of the people are signs of their comfortable and easy existence. Part of the Dutch Colonial army is formed of 'Amboinese', among whom are included people from Menado, the Sangi and Talauer Islands, and the Moluccas: they are strong, intelligent, obedient, and brave, and thus make admirable soldiers. The Amboinese are of superior intelligence to most of the Indonesian peoples, just and good tempered, so that in spite of their indolence they make good officials, and are found in many places in the lower ranks of the administration, and as plantation overseers: as the oldest subjects of the Dutch in the Indies, and as Christians they form the aristocracy of the Indies and scorn to mix with

other natives, but in spite of their Christianity and their superior position they are not remarkable for cleanliness or morality, and their long association with Europeans has resulted in the disappearance of many of the virtues of primitive peoples. They are a pleasure-loving people, and in spite of their religion very superstitious. The people are divided into *orang burger*, or burghers, and *orang negri*. The former are the descendants of early employees of the Dutch East India Company, who were given rights not conceded to other natives, and exempted from statute labour and taxation, but had to serve in a civic guard which patrolled the coast. When many of these privileges were abrogated they continued to occupy a superior position to the other inhabitants, the *orang negri* or country-folk, towards whom they are exceedingly arrogant, though in clothes, housing, and mentality there is no difference between them. They are found also in Minahasa, Banda, and Timor, and have still their own administration, exemption from statute labour, &c., and live in a separate part of the village or in special villages of their own. Efforts are, however, being made to do away with these differences, and the Christian burghers now take an equal position with Europeans.

The Amboinese are a strong and thick-set people, with dark skin, curly or wavy hair, flat nose, and thick lips. The women are slender in build, but are not at all good-looking. Neither sex blacken their teeth in the disfiguring fashion so common in the archipelago. The hair of the men is cut short and the clothing is simple—for the men a jacket and long cotton trousers, for the women a *sarong* and a *kabaja*. Different costumes are worn by the burghers, the *orang negri*, and among the Christians. The women wear decorated hairpins, and the girls ornament their hair with real or artificial flowers; they are very fond of perfumes, which they prepare from fragrant oils. The regents of the Christian villages often wear European clothes.

The villages are tidy and well laid out, each having as a rule a church and school and sometimes a *baileo*, now no longer used for meetings, but only for storage purposes.

Agriculture is unimportant, the ground being unsuitable for many crops: spice trees and coco-nut palms, with some coffee and cocoa, are grown, and palm-wine is much drunk, drunkenness at feasts being common among both Christians and Moham-

medans. Sago is imported from Ceram, and the people live largely on fruit and vegetables : goats and sheep are kept in the Mohammedan parts of the island, and pigs in the Christian villages.

Each native only exercises his trade or occupation to provide for his daily needs, and industry is at a low ebb, the few Amboinese craftsmen being found among the burghers : the art of weaving is not known. The natives seem to have small aptitude for commerce, and trade is in the hands of strangers.

The land is only cultivated by the *orang negri*, who are divided into *dati*, or communities, owning the ground in common and under a head, the *kapala dati*.

The *orang negri*, who have the right to till the ground, have the sole right to break up new land, and to receive the profit from the products of the village fields, to the exclusion of the burgher class. Fishing provides a means of livelihood for many of the natives.

Malay is spoken by the burghers and the Christian *orang negri*, except in Hitu, Asilulu, and the Uliassers, which have conserved their original dialects.

The people of the Uliassers (Saparua, Haruku, and Nusa Laut) number some 20,000, of whom about 5,000 are burghers, and they are now largely Christian in religion, though the people of Nusa Laut were formerly renowned pirates and cannibals. Sago is found, but is insufficient for the needs of the inhabitants and is imported from Ceram. Pottery is made in the islands.

Boano has a population of some 1,300, living into two settlements, and divided into *Boano Serani* (Christians) and *Boano Islam* (Mohammedans). The soil is not fertile, and the people are forced to seek a living on neighbouring islands.

Manipa had 800 inhabitants in 1905, of whom a hundred were Christians : much sago is grown on the island.

Banda Islands

The Banda Islands—Banda Neira, Lontor, Ai, Run, and Rozengain—are peopled with a mixed race numbering some 6,000. They are descended from strangers—Javanese, Makassars, and people from the neighbouring islands—settled there when the original inhabitants (who probably resembled the people of Ceram) were killed off or driven away by the Dutch East India Company in the war of extermination in the seventeenth century.

The majority of the population of the Banda Islands now resemble each other very closely, excepting the Butonese living on the coasts of the mountainous islet of Gunong Api, who have preserved their own language and customs.

The islands have lost their ancient prosperity, and everywhere are signs of decay : Banda, once the most important town of the Moluccas, is now small, and is not even garrisoned. Trade is confined to the Chinese and Arabs, who are the only prosperous people on the islands ; the natives live mostly by fishing, and nets and canoes form their chief wealth. They are indolent by nature, and industry is almost non-existent.

The native houses, made of bamboo and *atap*, stand in shady gardens of fruit-trees. The people are ruled by their village chiefs and councils, but they have no longer any political power, and the *pata-lima* and *pata-siwa* communities (called here *uri-lima* and *uri-siwa*), into which the people are divided, have no real significance. Society consists of three classes, the position of a man being denoted by the form of his cap ; marriages are only made among people of the same social class, and a dowry is paid for a wife, in accordance with her rank.

The Butonese on Gunong Api live chiefly by agriculture, tapioca being their main crop. The people in Run, who are engaged in nutmeg cultivation, are mostly Timorese and Butonese : they only numbered about 140 in 1908. Ai had a total population of 682 in 1906, of whom 300 (including 12 Europeans) lived in the settlement of Ai, whilst the rest were engaged as coolies on the nutmeg plantations. Rozengain has a population of about 100, living in the village and surrounding gardens, where vegetables, &c., are grown.

Kei Islands

The Kei Islands have a total population of about 26,000, about 14,000 on Great Kei, 10,000 on Nuhu Roa, and the remainder in the other islands of the group. Some 8,000 are Mohammedans, and there are a few Christians, but the majority are heathen, though the Mohammedans make many converts through their persistent propaganda, and the people are rapidly becoming semi-civilized. In the past the race has been much mixed with settlers from Makassar, Ceram, and New Guinea, so that the indigenous type is to-day almost non-existent, the natives being partly Papuan and partly Malay in type, though

curly or woolly haired people are less common than on the Aru Islands. On Great Kei there are two villages in the centre of the island, Banda-Elat and Banda-Eli, which are peopled by the descendants of the natives of Banda, who were driven from their homes in the seventeenth century by the Dutch, and still speak their own language, though they have borrowed many customs from the Kei natives among whom they live : they are all Mohammedans, and work as smiths and potters, making most beautiful vessels.

The villages were formerly surrounded by high stone walls and stood on steep hills, ascended by wooden ladders, but since the Dutch Government has put an end to native warfare, they are built on the shore, and the fortifications have fallen into disrepair. The houses, which are built of bamboo and *atap* or palm leaves and stand on piles each in its own garden, are clustered irregularly round a holy stone and various roughly carved wooden and stone images, representing the protective spirits of the village. Each settlement has usually also a meeting-house, and in the Mohammedan villages a mosque. Numerous families live in one house.

Mohammedan influence has caused the gradual appearance of jacket and *sarong* in place of the loin-cloth, particularly on festive occasions : earrings and bracelets are worn, and the teeth filed, and on Tayando the women have rings on their toes.

Unlike the customs of many of the Moluccan peoples, marriage is endogamic, but since the tribes are widely spread, a man usually takes a wife from another village. A large dowry, provided by the whole village, is paid for a woman, who does not come to live with her husband till the whole sum is produced. She then joins his tribe completely, and in case of her husband's death, his brother has the right to marry her with no further payment. Polygamy is rare, owing to the expense of marriage, though the women are far more numerous than the men in Great Kei ; divorce is common. Great stress is laid on social position : a man may not marry above his own class, and if he marries a woman of a lower class, he and his children take her rank. The three classes into which the people are divided, apart from the division into *pata-lima* and *pata-siwa*, which also exists, are : (1) *Melmel* (the aristocracy), who probably came originally from the islands to the west, and set great store by their ancient lineage ; almost all the people of Dula and

Nuhu Roa are *melmel* ; (2) *Rinrin*, who were probably conquered by the *melmel*, and live now in the interior of Nuhu Fut and Great Kei ; (3) *Iri*, people from New Guinea traded to the Kei Islands as slaves : though slavery is now forbidden, it still exists on a voluntary and patriarchal basis. These classes are divided into tribes, and in spite of its aristocratic framework, society is democratic in organization, and is connected with the possession of the ground, the untilled land being owned by the community and the cultivated ground by the individual. The right to the land is never alienated, and no stranger can possess ground unless he marries into the village. This system of land-tenure, which resembles that of Amboina, is an obstacle in the way of industrial development. The ground is on the whole little cultivated, and fishing plays a larger part in native economy, each village owning that part of the sea on which its land borders.

Sago is the daily food, and much palm-wine is drunk, since coco-nuts are abundant, whilst tobacco, sweet potatoes, maize, and rice are grown for local use. Nuhu Roa is less fertile than Great Kei, and has no resident Europeans. On the whole the natives lead a simple and somewhat poverty-stricken existence.

The people are dirty and quarrelsome, and there are still bloody disputes between Christians and Mohammedans, but they are not stupid, and are also described as being gay and hard-working. They are fond of hunting and fishing, and were formerly renowned sailors : the numerous boats built in the islands are still far the best in the Moluccas. Formerly the articles of daily use were beautifully decorated, and basket-work and carving are highly developed, though European influence has caused the decline of native art.

Aru Islands

Though all the larger islands of the Aru group are inhabited, the total population is only about 10,000. In the western islands, the Voorwal (front coast), where the Mohammedans and Christian population lives, the villages, which are built on the Amboina pattern, lie mostly on the coast and are often hidden in clumps of trees. In the eastern islands, the Achterwal (back coast), they stand on high rocks. If there are many deaths in a village it is the custom to desert it for another site, and some years ago a large number of the people fled to the interior

in fear of the devastating small-pox epidemics ; they are being brought together again in villages by the Government, which distributes vaccine to them.

The few hundred Christians and Mohammedans living on the western coasts are mostly Chinese, Makassars, and Buginese. The natives of the islands, who are pagans, resemble the people of Tenimber, though they are darker in colour and less fierce in aspect. They belong to the smooth-haired rather than the curly-headed race, the curly-haired types met with being probably due to an admixture of Papuan blood. (The Gungai tribe, who live in the interior of Wokam, seldom coming into touch with their neighbours, and are thus representative of the original inhabitants of the islands, have long smooth hair). The skin is less dark than that of the Papuans, and the lips are thin.

The people have a great reverence for Dutch authority, and willingly carry out the orders of the Government, thus contrasting with the natives of Tenimber and the Babar Islands. The people go unarmed, and slavery and kidnapping are unknown. In general they are a gentle, quiet race, when not inflamed by strong drink : there is little crime, and the old laws and customs of the island are still in force.

Wives are purchased, and the man becomes absolute master of his wife, his brother having the right to marry her on his death.

The people of the Voorwal are more industrious than those of the Achterwal, who are in an inferior and dependent position, their chief means of subsistence being the trepang and pearl-shell from the reefs round their islands, which they barter with the Voorwal peoples for sago. Some of the boats in use are made in Tarangan, though the natives are not such clever boat-builders as those of the Kei Islands, whence many vessels are imported. The people in the interior of the larger islands live by hunting, but the birds of paradise, which are much sought after, are becoming rarer. Trade, which is concentrated at Dobo, is almost entirely in the hands of the Chinese and Makassars.

The natives are divided into *Pata-lima* and *Pata-siwa*, as in other islands where Tidore and Ternate have ruled, with the exception of the people of Barkai, who are neutral ; there is now hardly any difference observable between members of the two parties. The men of the islands wear a single cotton gar-

ment, only the chiefs affecting more elaborate clothes, and the women a very tight and short *sarong* (which they weave themselves), but many bright-coloured bead necklaces, thick belts, anklets, bracelets, and ear-rings of copper and plaited leaves, and combs of wood or bone decorated with feathers or shell, are worn. The women have many marks made by burning on the upper part of their arms, but tattooing is rare.

The native houses, which shelter two or three families, are poor huts of rough wood and *atap*. They stand crowded together on piles, and are entered by a door in the middle of the floor. In the middle of the village, where the protective spirit of the community lives, is a shed, in the centre of which dishes are placed as offerings. Each village community has its chief: the uncultivated ground is owned communally, and the cultivated land individually, as in the Kei Islands. Questions of land tenure are unimportant, since very little ground is tilled, and such gardens as there are belong mostly to the Christian and Mohammedan population, but quarrels over the ownership of the pearl-banks on the uninhabited islands, which are also owned communally, are frequent.

The religion of the people is a gross pantheism resembling that of the Alfurs of Ceram, though there are no priests. The people are believers in the powers of evil spirits, and in spite of the long period during which Mohammedan traders have been in touch with the Aru islanders, they make no converts among the people of the Achterwal.

Tenimber Islands

The population of the Tenimber Islands is not known: it was estimated at 12,700 in 1880, and at 19,000 in 1889. The people, who are Indonesian and not Papuan in type, are strong and fierce-looking: their hair is smooth and black, but that of the men is often dyed yellow. Except for the Mohammedan settlers, who are very few, they are all pagan, and are exceedingly superstitious. Though they are trustful of strangers, cheerful, and honest, they are an uncivilized people, constantly at war with each other, and addicted to cannibalism up to late years.

Clothing is primitive. The forehead and arms are often tattooed, and an enormous bow, a bag for *sirih* and other trifles, and a cartridge bag decorated with beads, are always carried. The people are slaves to palm-wine, which is prepared by the

men, who also fish and hunt, search for *trepang* and tortoises, and break up the ground for cultivation: they also work iron, copper, and gold, and make ornaments. The women, who work much harder than the men, cultivate the fields, weave *sarongs* and dye the yarn, fish, and make plaited goods. Owing to fear of the natives, the islands are only visited by a few Makassar traders, who exchange linen for tortoiseshell, &c. Though the islands are not particularly fruitful, the natives easily supply their needs from coco-nut palms and fruit-trees, only cultivating very little ground: maize forms one of the chief foods, except on Yamdena, where more rice and sago are grown. Many pigs are kept, and much fish is eaten.

The natives are divided into three classes, the nobles, including the chiefs, the common people, and the slaves, who were formerly very numerous owing to the numbers of prisoners taken in the constant wars. The office of chief is hereditary, but his influence is limited, and women have often a deciding voice in the settlement of questions, even in a declaration of war against another tribe.

South-Western Islands

The South-western Islands, which include the Letti Islands, the Babar Islands, Roma, Wetar, and the Luang-Sermata group, are in general little known and little visited, since they are of small economic importance: and since the chief source of information is derived from the writings of a traveller of 1885-90, conditions may have changed. The natives are of the smooth-haired Malay type, and are usually friendly and cheerful, and very fond of song and dance: they are at a low stage of development, though they have a feudal and aristocratic social system, but they are giving up their war-like customs under Dutch influence. Only a single garment is usually worn. The houses, which stand on low piles, are crowded together on the top of steep rocks, usually near the shore, and surrounded by high stone walls. The people are divided into three classes (except in Luang-Sermata): the noble and land-owning class, the common people, including those vassals of the nobles who have become free, and the descendants of slaves. Marriages in the same class are made without payment, which is exacted in the case of misalliances, when the children take their mother's status. The religion consists of sun-worship, and a belief in evil spirits:

the souls of the dead are honoured as intermediaries, in particular that of the founder of the village, which dwells in an image standing with a holy *waringin* tree and a stone altar in the centre of the village. Each house has also its protecting spirit, whose image is set in the front wall. Even Christians, who are fairly numerous, since in earlier times there was considerable missionary activity in the islands, make these images, which are less rudely fashioned in Letti than in the more easterly islands. The people cultivate very little land, since the islands produce food in abundance ; and even fishing is little engaged in.

The Letti Islands have a population of about 20,000 : considerable cattle-production is carried on. On Kisar live the so-called 'Dutch heathen', about 300 in number, who are descendants of European soldiers of the time of the Company, and are differentiated from the other islanders by their fair skins and blue eyes and their European names. Their Christianity, however, leaves much to be desired, and in morals and intelligence they are not superior to the other inhabitants.

The Babar Islands have a population of about 10,000 ; 6,500 in Babar, and the rest living on Wetan, Masela, Dai, Dawera, and Dawelor. The natives resemble the people of Tenimber in appearance, customs, and dress. In some parts they live in a very primitive condition, only wearing a strip of bark, though in Tepa and a few villages on Wetan they are better clothed. The natives are very dirty, and head-diseases are rife. On Dai pots are made, and iron is rudely worked on Dawelor.

The Luang-Sermata Islands, which had a population of about 1,200 in 1885, are largely Christian, and Malay is much spoken : all the Christian and many of the heathen natives are well-clothed and are somewhat more industrious than in other of the South-western Islands, more land being under cultivation, and numbers of goats, sheep, buffaloes, and pigs being kept. The people have some capacity for trade and are good navigators, journeying to Timor and neighbouring islands to barter their goods, while Luang-Sermata is also visited by Makassar traders. Trepang and tortoises are collected, the women are clever weavers, and gold ornaments, much in demand in all the South-western Islands, are manufactured. The industry is confined to special families, so that the people, instead of being divided by the sharp class-distinctions of the other islands, belong to guilds which recall the caste system of the Hindus.

Wetar has a population of some 7,500, said to be extremely uncivilized : trade in trepang, tortoises, and wax is carried on by barter. The people are ruled by a rajah, with subordinate chiefs.

NEW GUINEA

Population : Numbers

Dutch New Guinea is still largely unexplored in the interior, so that it is impossible to enumerate the various tribes which inhabit the country. 'Papuan', the name applied to all the inhabitants, is a word meaning 'woolly haired', and is used in the same way as the name 'Toraja' in Celebes. The coastal natives also call themselves Papuans, as distinct from the people of the interior, whom they term Alfurs, but it is found, in fact, that each tribe has a different name, and differs in many ways even from its closest neighbours, with whom it is very probably at war. The Papuans of Dutch New Guinea are as yet little touched by civilization, though there are a certain number of traders, mostly from Ceram, Celebes, the South-West Islands, and Ternate, on the island, who collect sea and forest products, mostly visiting the south and west. Little is known of the ethnological differences existent among the Papuans, and the theory that the coastal population is a mixed race, partly Polynesian in origin, while the aborigines of the interior show a Negrito strain, is not proven.

There are, of course, no data on which to form an estimate of their numbers ; the population of South New Guinea, which forms part of the Amboina Residency, is given as 35,000, and the people of 111 villages in the explored part of Northern New Guinea of which a rough census was taken, numbered about 9,200.

Papuans

The Papuans are a strong and well-built people, usually of middle height, with regular features, somewhat prominent cheek-bones, a broad nose, thick lips, a large mouth, white teeth and dark brown eyes. They are often quite good-looking, and make picturesque figures with their many ornaments and their garlands of flowers, but the women become ugly whilst still young, since they are considered as inferior creatures, and have to do most of the hard work. The skin varies from nearly

black to light brown, the head being often disfigured by disease. Their chief physical characteristic is their woolly hair, which stands out in a bush from the head, and differentiates them from the smooth-haired people of the larger part of the archipelago. There is usually also a considerable growth of black hair on the face and body. On the slopes of the snow-mountains of southern New Guinea there are tribes of short natives, of which one, the Tapiro, only averages four feet nine inches in height, and so may be classed as pygmy.

The Papuans are a childlike and cheerful people. In places they are still cannibals, and they are frequently murderers and thieves. They are extremely lazy and dirty. Though they are fond of their children and their family, they are often wild and fierce to strangers, who are, however, seldom openly attacked, since the Papuans are cowards, and have no love for open warfare, preferring to kill their victim by stealth. Head-hunting is still rife, and it is thus never safe for a single native, or for the women and children, to go out in the bush alone. In some tribes no man is respected until he has brought home a head. Papuan society is in fact in a state of nature : in many parts only the authority of the head of the family is known, the only 'chiefs' being those who excel their fellows in intelligence and courage, and thus gain a certain influence, whilst on the north coast, where each village has a hereditary head, these have but little power, and are not differentiated in any way from the other inhabitants of the settlement : the counsels of the older men, though they have no official status, have considerable weight. There are no taxes, and little trace of law and justice : small misdeeds are settled by payment of fines, but the law of revenge is the only law in force. In the west of New Guinea, which has been more in touch with strangers, conditions are somewhat different, since a sort of aristocratic class, to which the *rajas* of the Papua Islands and of Mo and Arfu in the north-west of New Guinea belong, has been formed through pressure brought to bear from Ternate.

In many parts the natives go naked, and when clothes are worn they consist as a rule only of a piece of bark-cloth or trade cotton. Many ornaments are worn. The chief and often the only weapon is the bow and arrow ; daggers made from the thigh-bone of the cassowary are common, and lances, swords and choppers of stone or imported iron are met with.

The Papuans are partly settled, as in the Schouten Islands, and on McCluer Gulf and Geelvink Bay, where they have come into contact with traders; partly semi-nomad, possessing villages, but spending much of their time in the forest; and partly entirely nomad. The settled peoples are easily led to forsake their villages by sickness or misfortune, so that the villages are often in a ruined condition; they are not fortified, but are built, as a rule, in as inaccessible a position as possible, with the houses on high piles.

Sago, cooked or raw, forms the chief food, with *pisang*, coconut, sugar-cane, sweet potatoes, and the produce of the chase, largely pigs, cassowaries, crocodiles, kangaroos, &c., and fish. Hunting with bow and arrow, and fishing (for which the Papuans are badly equipped) with harpoons, bow and arrow, or sometimes nets, play an important part in daily life. The gardens are usually on a small scale, the products being often unimportant and of poor quality, and the land is allowed to lapse into the forest when it becomes infertile, though cultivation seems to be carried on better on the slopes of the mountains, and tobacco and vegetables are largely grown in the western peninsula. Water is often the only drink, though palm-wine is used in many places. No cattle-breeding is carried on, but a few pigs are often kept for use at feasts.

Industry is almost non-existent, consisting only in the making of rough pottery (particularly on the north coast) and of plaited work. Trade is carried on by barter, though old beads are in use as currency on the coast, where the traders come for sago, shell, birds of paradise, &c. On the coast every native possesses a small boat, but inland only portage is possible.

Marriage is apparently usually endogamic, and is often attended by no special ceremony. In Arso, on the western peninsula, a man must give another woman in exchange for his wife, and in the peninsula to the south of McCluer Gulf a large dowry is paid, the man being temporarily the servant of his wife's relations. Marriage by elopement into the forest is also common, and among the Seget, living in the interior of the north-west of Dutch New Guinea, a man may not marry till he has cut off two heads.

The Papuans seem to have no definite religious observances and beliefs, though spirits are feared, and a belief in magic is general; their wooden images are not apparently idols, and they

have no priests. In many parts there are large buildings, sometimes roughly carved and coloured, in which the young men sleep, and in which certain ritual ceremonies, of which little is known, are carried on. The women are not allowed to approach these houses, and are in many parts of the island allowed no part in the frequent feasts.

The most developed people on the north coast are those of Tanah Merah, Muris, and Demta Bays, where many people speak Malay, the gardens are cultivated with care, and trade is better understood; in spite of coming frequently into touch with strangers, the people of Humboldt Bay are still very wild. There are a considerable number of Mohammedan natives in McCluer Bay and on the south coast, owing to the presence of traders there.

The languages in use in Dutch New Guinea are exceedingly numerous and difficult to learn.

PAPUA ISLANDS

There is a considerable Mohammedan population, consisting of Malays and other strangers, and of Islamized Papuans in the so-called Papua Islands to the west of New Guinea (Waigiu, Gebeh, Batanta, Salwatti, Misol, and other smaller islands), in addition to the indigenous and pagan Papuans. The people of Gebeh are entirely Mohammedan, and closely resemble those of Patani (on Halmaheira), with whom they come frequently into touch. The Mohammedan population of the islands lives largely by fishing.

LESSER SUNDA ISLANDS

The standard of civilization differs very considerably in the islands of the Lesser Sunda Chain, and becomes lower progressively going from west to east: the people of Bali are among the most highly developed in the archipelago, and since Lombok is partly colonized from Bali and was for long under its domination, its civilization is largely Balinese in character. The Sasaks, the indigenous and somewhat less developed people of Lombok, in their turn strongly resemble the people of the west of Sumbawa, but the peoples of the more easterly islands, e. g. Flores, Timor, Sumba, &c., are very little developed, and are still largely outside Dutch rule and influence.

Timor, with Rotti and Savu

The total numbers of the population of Dutch Timor are not known, but it is unlikely that the natives number more than 380,000. In 1905 there were about 130 Europeans and 1,000 Chinese, with a few Arabs, Solorese, and Rottinese: many of the Chinese have settled in the interior and have identified themselves with the natives. The chief town, Kupang, had a population of 3,775 in 1905. The indigenous people are usually divided into Timorese, in the south-west of the island, representing the inhabitants of the old kingdom of Sonnebahit, and Bellonese in central and eastern Timor, representing the people of the kingdoms of Waiwiku, Waihale, and Luka. The Timorese are described as approximating to the Malay type, while the Bellonese show a Papuan element in their curly hair and dark skin. The Kupangs, who live in the extreme west of Timor and in the island of Saman, are distinguished as a group by a lighter skin, more slender body, and more wavy hair: they are sometimes stated to be a third and separate people, and by some authorities are thought to be Timorese mixed with people from the neighbouring islands of Rotti, Solor, and Savu. It is likely that these divisions of the people of Timor are a simplification of a really more elaborate ethnological system.

The natives of Timor are still very primitive, and the native kingdoms, about forty in number, are constantly at war one with another. The usual dress of the men consists of two pieces of patterned cotton material, woven by the women, with a heavy decorated belt, and a bag hung over the left shoulder. The women's dress is even simpler. Armbands, often finely worked in silver, gold and silver plaques on the chest and forehead, earrings of glass or pegs of wood decorated with tufts of hair, and necklaces of glass, quartz, and clay beads (which are much valued), are the more common ornaments. The weapons of the Timorese are knife, gun, and spear, and they are great riders: the Bellonese use also bow and arrow, shield, and a blow-pipe for hunting. The princes, the leaders in warfare (who are very important people in communities constantly at war) and the heralds, have special decorative garments. Tattooing is very common, each family having its special token, which is even used on the horses.

The usual Timorese houses are round, stand on piles, and are built of wood, with a roof of grass or palm-leaves reaching nearly to the ground. There is only one room, with a central fireplace, and no windows, except in the case of the houses of princes and notables, which are larger, square, and have usually a verandah. The villages, which are small, and often the houses, are stockaded, and are built in positions difficult of access. In front of the chiefs' houses hang heads, and in many villages there is a walled enclosure, with a stone in the centre, where newly-captured heads are laid for celebrations with dancing and singing. All the natives hate and fear water, and clean themselves with the milk of the coco-nut.

As might be expected in the unsettled and insecure state of the country, agriculture is at a low stage of development, the natives only growing enough maize or rice to satisfy their own needs. Horses and buffaloes are left to find their own food. Pigs and goats are numerous. Industry consists only in the making of ornaments and of plaited work. Trade is mostly in Chinese hands.

The natives are pagans, except for a certain number of Protestants in the west, and a leaven of Roman Catholics in the east. The Roman Catholic Mission in Belu had 2,852 converts in 1914. Many places—mountains, rivers, stones, trees, &c.—where offerings are made from time to time, are holy, and must not be approached. The offerings are made by priests, and among the Bellonese the chief has often priestly rank. The dead may not be buried till their debts are paid, so that the corpse is often kept above ground in a coffin for years. Polygamy is sanctioned by the Timorese, but not by the Bellonese, who, however, practise concubinage.

Many dialects and languages are spoken, the commonest being *Aawan* in the west and *Tetum* in the east. Malay is spoken by foreign colonists in Kupang.

The people of Rotti, who number some 60,000, have a reputation for thrift and good temper: they are Christianized to a considerable extent. The Rottinese language is divided into several dialects, but these bear a considerable resemblance one to another.

The people of Savu, who are probably a mixed race of Timorese, Rottinese, and people from other neighbouring islands, number about 15,000; a large number are Christians, and there were

861 converts in 1914. Both the Savunese and Rottinese have emigrated to neighbouring and more productive islands in considerable numbers.

Pantar

The population of Pantar is about 7,900, the southern part of the island being uninhabited. The natives on the coast, who are very intractable, are decreasing in numbers, partly owing to intermarriage and partly to emigration to Portuguese Timor in search of work : they numbered some 1,900 in 1914. The people of the interior are taller and more strongly built than the Alorese, and are also more civilized. The Dutch Government is endeavouring to collect them into villages, since many live in separate houses, standing in their own gardens and fields, and only assembling near the chief's house for celebrations. These villages are scattered and unfenced settlements.

Agriculture, industry, and trade are similar to those of Alor (see below). Pantar is a somewhat poor island, where both food and drink are often scarce. The people of the coast are nominally Mohammedan, whilst those of the interior and of the islands of Tewerin and Dolabang are pagans. In Blagar and Barmusa different languages are used in the interior and on the coast, mixed with many Malayan words. An Alorese dialect is used in Pardai.

Alor

Alor, with its dependent islands, had a population of 50,000 in 1912, divided into coastal and mountain peoples, the latter resembling the Timorese in appearance and customs. They are primarily warriors and hunters, agriculture being left largely to the women and children, and they are hostile to strangers, though tranquillity has now been established by the Dutch. The mountain peoples have become more civilized, so that they now engage in trade with the people of the coast, who are descended from settlers from Java, Saleier, Solor, &c.

The Alorese are a strong and well-built race, and conditions in the mountains are healthy, although small-pox was rife some years ago. Only one garment is worn, and the bow and arrow is the chief weapon. In spite of their warlike past, they are by no means brave, and much prefer to slay their enemy by stealth, flying in terror from Dutch troops.

The mountain villages are always built in as inaccessible a spot as possible, and are defended with bamboo fences and sometimes stone walls : the houses stand clustered together surrounded by maize- and rice-fields, and are visible at a great distance. The coastal villages are more regular in arrangement. The houses in the hill settlements, which stand on piles, are solidly built, with sloping roofs of *alang-alang*. The houses in the coastal villages, which usually stand on the ground, are comparatively spacious and well-built.

The mountain people live mostly by agriculture, and the coastal people by fishing. Rice, maize, tobacco, and various vegetables and fruits are grown, whilst cotton cultivation has lately been introduced. Hunting, however, is the chief occupation of the men. Pigs are kept in large numbers. Industry is on a very small scale : coarse sarongs are woven on the coast.

The mountain peoples are divided into tribes ; each family possesses its hereditary fields, and rice and maize are traded at the coast for clothes, &c.

All the mountain peoples and also many of the coastal inhabitants are pagans, having a system of prohibitions (*pemali*) which is also observed by the Mohammedans of the north-western peninsula and Kiu, who are lukewarm in the practice of their religion. The pagan natives worship wooden images, mostly of snakes and crocodiles.

There are some twenty chief languages in use in Alor, differing widely from each other, each tribe and often each village speaking a tongue of its own.

Flores, with Solor, Lomblen, and Adunara

The population of Flores is estimated at 500,000. That of Adunara is probably about 25,000 ; that of Lomblen about 32,000 ; that of Solor is not known. The chief town, Larantuka in the east of Flores, had a population of 4,665 in 1905.

The islands lie in the zone which forms the frontier between the Papuan and the Malay race : generally speaking, the people of the west of the island, the Mangarese, are markedly Malay in type, being small and lightly built, with light brown skin, smooth or wavy hair, and little hair on the body, whilst the people of central and eastern Flores and the Solor Islands are more Papuan in appearance, having a darker skin, curly hair, and a more strongly-built frame, though neither the pure Indonesian or the

pure Papuan type is found. The different tribes are usually named after their district, and the indigenous heathen population, of whom very little was known up to late years, has been largely pushed back into the interior by the people from Makassar, Sumbawa, Sumba, the Solor Islands, &c., who have settled on the coast: in Todo, Manggarai, there are colonists who are thought to be descended from Menangkabau settlers, and the people on the Endeh coast are said to have originated in shipwrecked Chinese from Majapahit.

The people of East Flores, who are largely Christian, are said to be good-tempered and willing, and those of the interior are very shy: they form a great contrast with the population of Central Flores and the Solor Islands, who are warlike and insolent, lovers of drink and gambling. The people of Endeh are mistrustful, but they and the Manggarese are the most developed of the natives, apart from the Christian population. The people of Ngada are said to be honest and frank in their dealings with others, brave and faithful: murder, drunkenness and immorality are rare among them, but they are very dirty in their persons. The people of Endeh have a script of their own, resembling that of Makassar. Since the pacification of the island in 1907, conditions have rapidly improved, and Flores has now a promising future before it.

Whilst in the east and south of the island trousers and a head-covering, and often a jacket or *sarong* are the common dress, in the west only a short *sarong* is worn, though the clothing differs considerably among the different tribes. A bag for *sirih* and other necessities is always carried. The ceremonial garments are often elaborate, and many rings, bracelets, and anklets of gold, silver, copper, or tin (or in the east more usually of ivory or shell) are worn, whilst the women wear knobs of metal, coral, or decorated bamboo in their ears. In Ngada the women's ears are hung with numbers of copper rings, and necklaces, preferably of old beads, are worn by everyone in the east of Flores and in the other islands to the east. In general, the covering of the body with garments is becoming more and more usual, as a result of foreign influence.

The natives live mostly by agriculture, the chief food being maize, superseded by rice where the ground is favourable for its cultivation, whilst many coco-nuts grow on Adunara and Lomblen. Though considerable numbers of horses and buffaloes

are kept, meat is little eaten except at festivals, when pigs, dogs, hens, and even cats and rats, are consumed, and the Mangarese are very fond of locusts and earth-worms. The people of the Solor Islands hunt sharks and fish with harpoons, and are renowned smiths : *sarongs* are woven, and boats built in Lomblen.

Most of the inland villages stand on hill-tops and are visible from a long way off but difficult to reach, whilst in the coastal villages in the Solor Islands the houses are perched on the mountain side overhanging the water. Where European influence is slowly making itself felt, the villages stand on the flat ground. The houses on the hill-top settlements are larger and less numerous than those in the villages of the plain, and are grouped round a square, in which stands a big tree, and, in the case of tribal villages, a round platform—the grave of the father of the tribe, where feasts are given. The people are exceedingly dirty, so that the absence of water in the mountain villages does not distress them, and the settlements are usually very unclean and dilapidated. Those of Ngada, however, which are built on terraces, are neat, and regular in their arrangement, and are surrounded by a hedge and thickets of bamboo, outside of which stand the barns. The Manggarai houses are conical in form, with a roof reaching to the floor : they are divided into separate rooms for the different families, and a passage where the unmarried men and the strangers sleep. In the east and in Adunara the houses are smaller, and are only inhabited by one family, the natives often living permanently on their rice-fields, and only coming into the village for feasts. On Adunara the houses of the well-to-do have an inner and outer wall to prevent the inhabitants from being struck through the wall by lance or bow and arrow ; between the walls is a passage where household goods are kept and elephant's teeth, imported in earlier times from Further India, which form the chief riches of the Adunarese. The houses stand on the ground, but the sleeping-places are raised. In Endeh the houses are square, and are often roomy and well-built. In Ngada they stand on piles, and have very high roofs, which often come down below the floor-level, so that the interior is very dark and stuffy : in front are an inner and an outer verandah. These houses, which are decorated with carving, usually only shelter two or three families. Each village has its barns, which stand on piles, and in East Flores and the islands a *pemali* house, an open shed in which stand the carved sacrificial stakes.

In almost the whole of Flores the ground is owned communally by the tribe, impersonated by the *tuan tanah*—often a descendant of the man who first cultivated the soil in that place—who is one of the four elders of the village and can stop calamities and avert illness ; where the *tuan tanah* is still in power, the chief or prince has no power over the land, unless he is *tuan tanah* as well, but in many parts the influence of the elders is waning, and the village or the district is taking the place of the tribe as a land-owning community. The cultivated land belongs to the man who first breaks it up, and only members of the community have the right to the products of the waste land : but land-tenure differs in different parts, and in parts of Ngada only the hereditary tenure of the individual, as distinct from communal possession, is known. Here the products of the uncultivated land are free, and a stranger can own the land he breaks up, whilst in the rest of the island he has no rights of possession.

Marriage is patriarchal in character, and the woman has no freedom of choice : a wedding is arranged by the family or the community, and is the occasion of many festivities. In Manggarai the husband stays for a time in his wife's home, before taking her to the new room which has been added to his own family house for their accommodation. A large dowry is paid for a wife, and the husband is bound to care for and assist his parents-in-law and his wife in every possible way, and to live with them till the dowry is entirely paid up, so that the possession of daughters is counted as great riches, and the kidnapping of young girls and children is common on Adunara and Lomblen. In Ngada, if there is a family which has no sons, the husband often goes to live and work permanently for his wife's people, clearly a remnant of matriarchal institutions. In these cases no dowry, or only a very small one, is asked. Polygamy is rare, but child-marriages, or rather betrothals, are common. The morality of married couples is, on the whole, high, and in Ngada in particular divorce is very rare. Large families of children are only found in Endeh. Bodies are usually wrapped in linen and buried, but in the case of well-to-do people they are placed in a wooden coffin, and a considerable period, during which the wherewithal for the burial feast is collected, elapses before burial. In Ngada only those who have died a natural death lie within the village, those who have perished from violence being buried outside, often in a communal grave. In Central Flores corpses are not buried but exposed on

scaffoldings, and in the west of Lomblen the head of the corpse is dug up some time after burial and laid in a shed. The son or the brothers of the dead man inherits his property, and in Ngada possession only goes in the male line.

Most of the people of the interior of Flores are pagans, the coastal population being Mohammedan and Christian. In 1916 there were about 33,000 Mohammedans, mostly living in Manggarai, Endeh, and the Solor Islands, though in Endeh there are still existent Roman Catholic practises, a remnant of the missionary activities of the Portuguese and of the Christian confraternities of native notables: the influence of Christianity on the islanders has not, however, up to now been very happy. The pagan religion of the natives has small influence on their daily life, but as usual in these islands the souls of the dead are held in high honour, and in each large village and each ricefield is a sacrificial pillar or altar, which in the east of the island stands in a house. The people of Ngada differentiate between good and evil spirits, living in the earth and air. Feasts are numerous, particularly among the Christian population, and dance and song are popular everywhere.

The natives are divided into tribes, ruled by elders or heads of families. Each village, however small, in East Flores, and also here and there in the Solor Islands, has four elders, who manage all the religious and communal duties, of whom the *tuwan tanah* is one. Though many villages have joined together to form districts under a district head, the real power remains with the village chiefs. In Endeh, where the society is more highly developed, the people are divided into the noble, the middle, and the lower classes. The nobles are never seen without an armed following. In Ngada there are only two classes, since slavery was abolished—the descendants of the founder of the community and the common people; a woman of the first class may never marry a man of the second class.

Sumba

The total population of Sumba is not known, but the west is the only thickly-peopled part of the island. Besides the Sumbanese themselves there are a number of people from Endeh (Flores) living chiefly at Waingapu, the capital, and the larger part of the east coast is inhabited by natives of Savu and Rotti,

who are hard-working and industrious, and are supplanting and establishing supremacy over the original inhabitants. The Sumbanese have long straight hair, and are a fine neatly-made people, rather bigger than the Javanese : the women are often handsome. They are said to be a dishonest, cruel, and cowardly race, and their chief virtue seems to be hospitality : they are very dirty in their persons, and do as little work as possible. The men wear a shawl and loincloth and a head-covering, and the women a *sarong* ; but in the interior the clothes worn are simpler, sometimes only a belt and hat. Both sexes have bracelets, gold chains, and ear-rings.

Except in the west of the island the villages are small, and consist of only a few houses, which are large primitively-constructed buildings standing on piles. The villages are surrounded by strong palisades or high stone walls, and there are many graves in the square, since the natives dislike burial outside the settlement. These graves consist generally of four upright stones with another laid across, and are often decorated with carving.

The Sumbanese cultivate the soil, make baskets and fishing-nets, collect forest products, birds' nests, and turtles, and work in iron and copper, and a considerable number of the men live by theft. Fishing is confined to the rivers, as the natives fear the sea. The women make pottery, and spin, dye, and weave cotton material, except in the interior of the island where no weaving is carried on. Little trade is done, except in horses, of which a large number are exported from Waingapu : it is still largely carried on by barter—cotton stuff and kitchen knives being the most popular articles given in exchange, though the use of money is increasing gradually, and coins also form a favourite decoration for the little boxes which are always carried by the Sumbanese as a receptacle for valuables, charms, &c.

The natives are pagans, and have no temples, only stone altars on which the offerings are hung in baskets : officials called *hatu* play an important part in the frequent offerings of sacrifices. A particular breed of horses is held sacred. The feasts, which are accompanied by much music and dancing, and by mock combats on horse-back and on foot, are very uproarious.

Marriages, which are more easily dissolved than contracted, take place by arrangement between the parents, by the payment

of a large dowry, or by elopement. Polygamy is common, especially among the upper classes.

The Sumbanese language, which is closely allied with Savunese, has no written form : it is divided into a number of dialects.

Sumbawa

The indigenous people of Sumbawa are of Malay type, but are sharply divided into the natives of the western peninsula, i. e. of Sumbawa, who greatly resemble the Sasaks of Lombok, and those of the eastern peninsula, i. e. of Bima, Dampo, and Sanggar. Except for a small number of Christians in Bima, the capital, and the pagans in the mountains to the west and north-east of Bima Bay, the whole population is Mohammedan. The total population of the island is not known ; there are about 50,000 people in the Bima district. The island is divided into four parts—Bima, Dampo, Sanggar, and Sumbawa.

The people of the first three districts, who resemble each other closely, are short and thick set, and the women are often good-looking and fair-skinned. Men and women wear trousers and *sarong* of stripped cotton. The natives are described as being somewhat stupid, timid, and weak ; they are divided into nobles, people, and enslaved debtors (*pandeling*), and the people are again divided into guilds, according to their trade.

The houses, which are small and stand on low piles, have a large living room, with two sleeping-apartments divided off by a low wall, and an open verandah. Though the cattle are not kept under the houses, but in separate stables, the ground is nevertheless very dirty. The rice is kept in numerous small barns.

Agriculture is the chief means of livelihood, numerous crops being raised, in particular rice, maize, onions, and fruit-trees ; horse and cattle-breeding are also important. Many people live by hunting, but fishing is unimportant. Rough garments are woven, weapons fashioned, and mats, &c., plaited, but only local needs are provided for. Here and there forest products are collected on a large scale, but trade is in general less than formerly and is largely in the hands of strangers.

The language of Bima and Dampo, which is allied with those of Sumba, Savu, and Flores, differs considerably from that of Sumbawa, but has few dialectic differences of its own. There is only a very scanty written literature, though there are numerous native songs, which are not committed to writing.

The number of people in Sumbawa, which is very thinly populated, is unknown, being estimated at 26,000 in 1850 and 40,000 in 1876, partly composed of Makassars, Buginese, Chinese, Arabs, Orang Bajo, and a few Europeans, the interior being almost uninhabited. The houses differ very much from those of Bima, since they stand high above the ground, and are divided by movable partitions into five or six rooms.

The people, who closely resemble the Sasaks of Lombok, since Lombok was formerly a dependence of Sumbawa, are timid, submissive, and comparatively uneducated and undeveloped. The men wear a gaily-coloured *sarong* and *slendang*, and the women a longer *sarong* and a jacket of flowered material; gold and silver ornaments are never worn. The people hold firmly to the tenets of Mohammedanism, and never indulge in the noisy feasts which are common in many islands. They are divided into the nobles, the people who live near the capital and cultivate the land of the Sultan, the common people, and the strangers.

Lombok

Lombok is partly inhabited by people from Bali, Hindu by religion, who live in the north-west; the rest of the island is peopled by the Sasaks, who are Mohammedans, and are in the great majority, although until 1894 they were under the dominion of the Balinese, a solitary example of a Mohammedan people being ruled by a race professing an older pagan religion. The total population of Bali is probably about 360,000, of whom over 300,000 are Sasaks.

Physically there is little difference between the two races, but the Sasaks are intellectually inferior, and the long and oppressive domination of the Balinese had not a good effect; they are, however, industrious, patient, and docile, and their villages and houses, which are built on the Javanese pattern, are much cleaner than those of the Balinese, which are defiled by the number of pigs kept in them. In customs and morals the Balinese resemble their kinsfolk in Bali; industry is at a high level, and though the Sasak industries have slowly developed under Balinese influence, they remain at a much lower level. Clothes and mats are woven, and there are now a number of gold and silversmiths.

The Sasaks wear a *kain* and a white head-dress, and the

women long dark sleeveless jackets ; their clothes thus distinguish them from the Balinese, and their *kris* is longer. Since the Dutch occupation, agriculture has thriven. Export trade is largely in the hands of foreigners, but the inland trade is carried on largely by the Balinese.

The Sasaks are not fanatical Mohammedans, but they keep some of the rules and precepts of their religion with great strictness, and are very rarely converted to Hinduism, except in the case of intermarriage with the Balinese, which is, however, forbidden to Balinese women of high caste on pain of death.

The Sasak and Balinese languages are quite distinct, and are mutually incomprehensible ; that of the Sasaks has more affinity with the tongues of Bima and Sumbawa, and contains many Malayan and Javanese words. Most of the more important people can speak Balinese, and the few Sasaks who can write their language use the Balinese script ; the only literature is translations of Javanese or Malayan works, written in the Bali Yawa tongue, which resembles the Javanese Krama.

Bali

The Balinese, who live in Bali and the western part of Lombok, are descended from Hindu-Javanese emigrants, Bali having been constantly in touch with Java, owing to the proximity of the two islands, since the earliest times. The chief waves of emigration from Java to Bali took place in the ninth century, after the fall of the Hindu kingdom in central Java, and again in the sixteenth century, after the fall of Majapahit. The aboriginal population of Bali was thus long ago absorbed by the Javanese emigrants, with the exception of the Bali-Aga, who live in villages in Sangsit, Krobokan, Sembiran, and Buleleng, and in the south of western Lombok, and are thought to represent the descendants of the indigenous people. The other inhabitants of Bali call themselves Wong-Majapahit, as distinct from the Bali Aga. After the conquest of Java by Islam in the sixteenth century, Bali remained politically and socially independent till half-way through the nineteenth century, so that it is quite permissible to speak of a special Balinese civilization. Bali is one of the most thickly populated islands of the archipelago, resembling Java in this as in many other aspects ; its total population is probably about 1,182,000. The chief towns, with populations in 1905, are Singaraja (8,727) and Negara (6,651).

It is difficult to describe a typical Balinese, since so many different types have arisen, but in general it may be said that the Balinese are a well-built people, having much in common with the better-class Javanese, though the skin is somewhat lighter. The dark hair is worn long, and fastened up on the head, by both sexes, except by the princes and nobles, who cut it short, and often wave and curl it. The women are pretty, slim, and well built. Both in body and mind the Balinese give the impression of being stronger than the Javanese : they are more observant and argumentative, and though they are polite, they are lively and outspoken, and are always good tempered and cheery. They are hospitable, loyal, and eager to learn ; careful and zealous in the practice of their religion, and, in contradistinction to most of the peoples of the archipelago, thrifty, always saving up for their cremation after death. The faults of their virtues are found in their devotion to feasting and gambling, and their indulgence in immoral practices, though the latter are more common among the well-to-do than among the poor. The women are industrious, clean, and modest, but they take a very inferior place in Balinese society and are much overworked, though their lot has been somewhat improved under Dutch rule, and some of the more objectional customs, such as the enslavement of widows without sons, have been put an end to.

The men wear a long narrow loin-cloth, and over it a garment (*saput*) fastened round the body under the arms, with a long end hanging in front, and a *kris*, or sword ; jackets are now common among the well-to-do. The common people wear a piece of cotton material on their heads, but the nobles and priests go bareheaded, an umbrella being held over them when they walk out-of-doors. A large *kris* is always carried thrust in the belt. The priests (*padanda*) wear long garments, with elaborate head-dresses and ornaments, at religious ceremonies. The women have two garments, one over the other, the upper part of the body being left bare, except on festive occasions. Both men and women wear flowers, natural or fashioned out of gold, in their hair, and the women distend their ears with cylinders of gold or of lontar-leaves, set with a plate of gold and precious stones ; large necklaces and brooches are common, and garments of gold-leaf, with many jewels, are worn at weddings. The two great pleasures of the people are the

music of the *gamelan*, or native orchestra, and the performances of the *wayang* or theatre ; as in Java, cock-fighting is exceedingly popular, and many dancing girls and men are kept by the princes for their amusement.

The Balinese villages are built as regularly as the ground permits, the houses standing in gardens full of fruit-trees on each side of a broad road. These gardens are surrounded by high walls, which form a continuous line along the street. The chief people live in the market-place. The villages and gardens are very dirty, and the roads, which are only mended for the funeral procession of a prince, are full of holes, though these matters have been improved since the establishment of Dutch rule. The inhabitants of a village are bound together by strong ties, and the rights and duties of the community are enshrined in written laws. There are two types of village societies : in the older the number of members is limited to the heads of those families which are descended from the original founder, and the business of the community is managed by a council of elders. In the second type of village, those where a large number of strangers have settled, all the heads of families are members of the society. Apart from these village societies there are a number of agricultural associations (*Sakaha subak*) which control the possession, cultivation, and irrigation of the country.

The premises of a Balinese family, which are oblong in shape, are divided into three parts : in the first are the rice-barn, the stable, and a place of lodgement for guests ; in the second the bedrooms and kitchen of the family, and in the third the temple belonging to the house. The living-rooms are of clay, roofed with *atap* or reeds, or of stone in Karang Asem and Bangli. There are usually no windows, ventilation being effected through the opening between roof and walls. Pigs, fowls, and dogs run loose in the garden. The establishments of the princes and nobles comprise a large number of different buildings and rooms.

The Balinese are excellent farmers, surpassing all the other peoples of the archipelago in rice cultivation : many other crops, such as coffee, tobacco, and coco-nut palms, are grown, and the breeding of cattle and pigs forms an important part of Balinese daily life, pork being the only meat eaten. The animals are very well cared for, and cattle are exported in large numbers. Rice is the chief food. Water is the usual drink, but palm wine and other strong drinks are popular, and the use of opium is wide-

spread, though the action of the Régie in raising the price of opium, combined with the thrifty character of the natives, will probably result in a diminished consumption.

Leprosy, venereal disease, and goitre are common, but serious epidemics of cholera or small-pox are now of much less frequent occurrence, owing to vaccination and improved hygiene.

Industry has reached a high level, and art is still alive in Bali, and is bound up with the life and religion of the people. Weaving, plaiting, metal-working, and wood-carving all flourish : the woodwork is coloured and gilt, and beautiful weapons and other objects are made in embossed gold and silver. The forms of decoration, and the reliefs on the walls of the temples, show Hindu influence and are executed with a great feeling for beauty. Many priestly possessions, such as censers and musical instruments, are made of copper in Klungkung, and material interwoven with metal threads in Karang Asem and Buleleng. Patterned baskets, mats, &c., of bamboo and leaves, and cloth decorated with gold-leaf are made in many places. Fine pottery, particularly long-necked water-jars, is also manufactured.

The religion of Bali is Hindu in origin, but has become much mixed with the animistic ideas and superstitions of the Javanese and Balinese. Siva is worshipped, as well as other innumerable gods and spirits, while Krishna and Vishnu are regarded more as divine powers of Siva than as separate gods, and this Brahmanism is much mixed with Buddhism. The whole life of the Balinese is permeated with their religion, and is a continual struggle to propitiate the gods and keep away evil spirits by the observance of numerous ceremonies, and by the making of sacrifices. Transmigration of souls forms an integral part of their belief. Neither Mohammedanism nor Christianity has been able to make any headway in Bali. The religion of the Bali Aga is Polynesian in type ; they do not recognize the authority of the *padanda*, and are not divided into castes. Temples and places of sacrifice are very numerous in Bali, each village having three or four communal temples, i. e. the chief temple, the temple of the dead, the temple of the sea-god (on the coast) or of the mountain-god (in the hills). There is often also a temple to the god of irrigated fields, built in the rice-fields : the chief temple is in the village, but the temple of the dead and the place of cremation are outside. The temple on the slopes of Gunung Agung in Karang Asem is the holiest of all. Each

temple has a *mangku*, who presides over the offering of sacrifices which are made on the occasion of every family happening, and is much respected in the community for his holy life.

The Hindu religion brings in its train the caste-system, which is still existent in Bali, the people being divided into Brahmin, Ksatria, Wesja, and Sudra, each of which divisions consists of various sub-divisions. The three first-named classes form the nobility, and the last the lower class of the people. The castes have now no connexion with the occupations or duties of the people. The priests, who are Brahmins and holy, take a very high position, and the knowledge of the holy books of the law, and of the innumerable ceremonies, required of a candidate for the priesthood is very extensive. Women can become priests, and the wives of the priests are initiated into their husband's knowledge of holy things, but those who, at their ordination vow themselves to celibacy, take the highest rank in the priesthood. The rules which a priest must observe are many, and demand great strength of will in the keeping, and they are in truth as a rule very trustworthy people. The low-caste natives, the Sudra, are not despised, and are only considered unclean when they have been brought into any specifically unclean circumstances, e.g. such as is involved in the touching of a dead body. A man may marry into a lower caste, and this permission is leading to a slow levelling of social distinctions, but a woman is forbidden to marry below her caste, and any woman living with a man not of her own rank is severely punished, and formerly suffered the death penalty. The princes, who were of the Ksatria or Wesja caste, were regarded as divine emissaries, and their commands were more powerful than the law. Though the former privileges of the noble castes, and the system by which the punishment for wrongdoing was progressively less as the caste was higher, has been changed, those privileges which spring from ritual observances are unchanged, and the period of uncleanness resulting from touching a corpse is still five times as long for a low-caste man as for a Brahmin. The custom of *suttee* has, however, at length been put an end to.

The Balinese language, which is also spoken in part of Lombok, closely resembles Javanese, and includes many Javanese words : it is in fact spoken of as Javanese by the Bali Aga, whose pronunciation is old-fashioned, and who do not use the 'high' words, i.e. the alternative forms of many words which are

employed in addressing superiors and strangers ; the various different forms of speech existent in Java are not, however, in use in Bali. The alphabet is derived from the Javanese, and the literature, apart from old Javanese works, consists of poems more or less strongly influenced by old Javanese examples. The Balinese have a special calendar of their own, but the European almanac is coming more and more into use among the educated classes.

There are four forms of marriage, the most correct being that in which the father of the young man makes application to the nearest relation of the girl, but elopements are very common : well-to-do Balinese have usually more than one wife. The body is always burnt after death, except in the case of condemned criminals, or people who have died of small-pox or leprosy, but is sometimes buried for a considerable time until a suitable opportunity for cremation occurs.

CHAPTER VIII

GOVERNMENT AND ADMINISTRATION

Home government (States-General—The Sovereign)—Colonial central government (The Governor-General—Council of India—*Volksraad*—General Secretariat—The departments)—Local government (Territories under direct rule—Native self-government—Native principalities of Java—Direct administration—Administrative divisions—The *Desa*—Reforms of local government)—Justice (Government justice—The courts)—Police—Defence (Army—Navy)—Finance (Revenue—Taxation—Monopolies—Government cultures and services—The budget)—Foreign consular services.

HOME GOVERNMENT

WHEN Netherlands India was retroceded to the Dutch in 1816, the ultimate authority in colonial affairs was vested in the Dutch monarchy. The government of the colony is still exercised in the Sovereign's name, but the former power of the Crown has passed into other hands. It now almost entirely belongs to the States-General and the Minister responsible to that body for the colonies.

States-General

By the *Grondwet* of 1848, which defined the constitution of Holland, the States-General acquired the power of formulating the principles of colonial government, and in 1854 it enacted a constitution for Netherlands India. Since that time the Dutch Parliament has made occasional use of its power in this respect, and among the laws passed the most notable are those which opened the ports of the Moluccas, determined the tariff policy, abolished slavery, enacted the *Comptabiliteitswet*, and instituted local self-government in India. By the *Comptabiliteitswet* the States-General secured the power to control the annual budget of the colonies and, furthermore, has a yearly report on colonial affairs submitted to it (see below, *Volksraad*, p. 248).

The Sovereign

Subject to the principles established by the laws of the States-General the government of Netherlands India is nominally

controlled by the Sovereign, but this control can only be exercised through the medium of a colonial minister responsible to Parliament. By the Indian constitution certain matters are exclusively reserved to the Crown (in practice, the Colonial Minister). These are : (1) the right to form new settlements in the islands of the archipelago, which includes the substitution of the direct rule of the Dutch colonial government for native rule ; (2) the division of the territory into provinces ; (3) the creation of administrative departments, and the appointment of certain officials, including the Governor-General, the Lieutenant Governor-General (should this official be appointed), the Vice-President and members of the Council of India, the President of the High Court, the President and members of the Chamber of Accounts, and the general officers of the army and navy. Certain powers wielded by the Sovereign under the Constitution of the Netherlands, such as royal right of coinage, conferring of decorations and noble rank, and the signing of treaties with foreign Powers (with the confirmation of Parliament) can be applied also to the colonies. The royal mandate is required for the levying of individual taxes and duties, for changes in the civil service involving increased expenditure, and for various other important measures. The Sovereign's power finds expression in the Royal decree (as distinct from a law of the States-General) in which the principles of individual legislative measures are outlined. Thus, the amendment of the constitution in 1903 was more elaborately set forth in the Royal Decentralization Decree of 1904 which inaugurated local self-government in India.

COLONIAL CENTRAL GOVERNMENT

The Governor-General

The head of the Government in Netherlands India is the Governor-General, who, from his seat in Batavia, rules the colony in the name of the Sovereign. He must be a Dutchman not less than thirty years of age, and have no private financial interest in the colony. He has both legislative and executive powers. His term of office is five years. As a legislator he can issue ordinances on all matters not already fixed by the law of the States-General or reserved to it, and those not determined by royal decree or reserved to the Sovereign. In times of emergency, subject to the ratification of the Sovereign or the

States-General, he can legislate on subjects reserved to either of them. He has the power to elaborate in the form of an ordinance the general principles of a legislative proposal as laid down in a royal decree. In this way the Decentralization Decree, already referred to above, became in 1905 the Local Councils Ordinance. The Governor-General can also postpone the operation of royal decrees, and initiate minor legislation.

In his executive capacity the Governor-General has first of all to promulgate and enforce the laws, and to secure the welfare of the natives. The laws are promulgated by publication in the *Staatsblad* and in the *Javasche Courant*. The Governor-General appoints and dismisses the higher administrative officials, fosters trade and industry, and superintends the cultures and industries belonging to the Government. He is the commander-in-chief of both land and sea forces, although the administration of the Dutch Home Squadron is subject to the Dutch Minister of Marine. In times of emergency he has the power of suspending the ordinary law and proclaiming martial law, and can make war and peace with native princes. Against undesirable persons, associations, and organs of the press, he can take the necessary repressive action, and he possesses the powers of summary arrest and deportation, besides those of pardon, amnesty, and dispensation. The control of foreign settlements is in his hands.

Council of India

The Council of India, consisting of a vice-president and four members, acts as a constitutional counterpoise to the power of the Governor-General. The members must be Dutchmen over thirty years of age, while consanguinity between them and the Governor-General is a disqualification. The Governor-General can nominate members, but appointments are made by the Sovereign acting through the Colonial Minister.

Originally possessing much power, the Council, in 1836, as a result of differences with Governor-General van den Bosch over the new 'culture' policy, was reduced to the position of an advisory body. By the constitution of 1854 it was practically confined to its consultative capacity, which was, however, strengthened by being legally defined.

The Governor-General is now compelled to obtain the Council's advice on all matters of interest, and in all acts and ordinances of the Government, on peace and war and general relations with

the native princes, on nominations to important offices, on measures in case of war and revolt and on all exceptional measures of a grave nature. For the final decision, however, the Governor-General is alone responsible, and he informs the Council of the result. The advice of the Council is also necessary for the dispensation or repeal of the laws of the States-General.

In case of a difference of opinion or a refusal on the part of the Governor-General to act on the suggestion of the Council, the decision of the Sovereign is invoked, although the Governor-General can in the meantime act on his own responsibility.

Recently suggestions have been made to expand the Council by the inclusion of members from Holland, who would be expected to represent a larger view of colonial policy.

Volksraad

The independent financial position of the colony (see p. 270) has led of late years to an agitation for a measure of colonial financial autonomy, and this has borne fruit quite recently. The States-General in the autumn of 1916 made the necessary constitutional provision for the institution at Batavia of a colonial council, in some measure representative, which should be empowered to discuss the colonial budget and military matters with the Governor-General. The result of such discussion was to be embodied in four ordinances. This council, under the name of the *Volksraad*, was opened by the Governor-General for the first time in May, 1918. It is a representative body of 38 members, 19 chosen by municipal and district councils, and 19 by the Government. The first council consisted of 19 Europeans, 11 Javanese, 2 Malays, 2 Minahasese, 1 Amboinese, 1 Achinese, 1 Chinese, and 1 Arab.

General Secretariat

The vast legislative and executive power concentrated in the hands of the Governor-General is administered by a body of permanent officials known as the General Secretariat, with a General Secretary at its head. The duty of the General Secretariat is to superintend the publication, dispatch, and registration of the instructions of the Governor-General. In practice it acts as his advisory body, and besides co-ordinating the work of

the various Government departments, it also gives both form and substance to the ordinary and secondary legislation. Its hold on the government of the colony is so complete that to it, according to an American authority, belongs most of the real power. The tendency to over-centralization which this department represents will be considerably modified when the recently inaugurated systems of self-government are in full operation.

The Departments

The administration of Netherlands India, at any rate at its centre, has always been organized to some extent departmentally. Under the Company there was a Director-General of Trade and a Master Merchant; Daendels appointed an Administrator-General of Trade with four Assistant-Administrators, while Raffles had an Accountant-General with two sub-accountants. After the restoration of the Dutch in 1816, there were various experiments with financial councils which finally resulted in the establishment of a Director-General of Finance with two directors under him, one to administer the colony's domains and properties and the other for products and merchandise. These offices incidentally serve to illustrate the purely commercial character of the Government of that time.

In 1832 a Director of Cultures was added, and in 1854 a Director of Public Works. In the following year the post of Director-General of Finance was abolished and five directorates were subsequently established—Finance, Properties and Domains, Products and Merchandise, Cultures and Civil and Public Works. In 1871 the directorate of Justice was added, in 1905 the directorate of Agriculture, and in 1908 the directorate of Government Works. The departments at present are seven in number: (1) Inland Administration, (2) Education and Public Worship, (3) Civil Public Works, (4) Finance, (5) Justice, (6) Agriculture, Industry, and Trade, (7) Government Enterprises.

(1) *Inland Administration*.—This department administers the system of provincial government, of which more will be said later; the general police and the armed police; private agriculture; forced labour; the *landrente* in Java and Madura and taxes akin to the *landrente* in the Outer Possessions; the inland system of credit; the cadastral survey; agrarian affairs, including matters concerning tenures, native ownership and leases, and lands in Solo and Jokyakarta. To this department in 1908 were

added an adviser with two assistants and an encyclopaedic bureau for the Outer Possessions, also an adviser for Chinese affairs.

(2) *Education and Public Worship*.—Within the sphere of this department come matters pertaining to the education of Europeans, natives, and Chinese, and the public worship of Christians and Mohammedans. It is also concerned with the promotion of knowledge of the ethnology of Netherlands India and the arts and sciences. The Civil Medical Service and philanthropic institutions of all kinds fall within its jurisdiction, while it also controls lotteries.

(3) *Civil Public Works*.—This department is concerned with waterways and irrigation, the building, repairing, and maintaining of lighthouses, bridges, &c.

(4) *Finance*.—This important department deals mainly with taxation, with the exception of those few taxes reserved to the Department of Inland Administration. The taxes with which the Department of Finance is concerned include all farmed taxes and estates in Java and Madura and the Outer Possessions. Under this head in Java and Madura come birds'-nest cliffs, pawnshops, Chinese gambling saloons and toll-bridges; and in the Outer Possessions the retail opium trade, intoxicating liquors, Chinese gambling saloons, slaughter taxes, tolls, pepper tax, fruit tax, and others. The department also controls unfarmed taxation, direct and indirect, the government monopoly in opium, government pawnshops, import and export duties and excise, and the public sale rooms. Attached to the department is an adviser for the recently established system of local financial autonomy. The department also has charge of the monetary system and the annual passes for ships.

(5) *Justice*.—This department administers the personnel of justice with the exception of those of the Supreme Court of Judicature who are appointed by the Sovereign; it controls, besides, advocates and solicitors, notaries, interpreters, and translators, and officials for Chinese affairs; within its sphere is the administration of orphans and estate courts, the regulation of the admission, removal, and extradition of aliens, the examination of regulations of the heads of provincial government and police judges, and the administration of the prison system; it compiles legal statistics, advises the Governor-General in matters of pardon, amnesty, &c., and deals with such other important

subjects as the equalization of natives and other Orientals with Europeans, naturalization, wrecks, slavery and credit bondage, the press, and rights of association and assembly, and, finally, controls labour inspection and the recruitment of coolies.

(6) *Agriculture, Industry, and Trade*.—Within the sphere of this, the most recently established Government department, are included native agriculture, agricultural instruction, Government agricultural enterprises, botanical science, laboratories, museums, and zoological science. Cattle-breeding, horse-breeding, and veterinary science generally fall within its jurisdiction, and it administers the Government coffee Culture. In the division of industry and trade matters relating to chambers of commerce, consuls, patents, and industrial exhibitions and the societies connected with agriculture, industry, and trade are dealt with.

(7) *Department of Government Enterprises*.—In this category come the postal service, telegraphs, telephones, the Government automobile transport, the exploiting of the State railways and tramways, and the supervision of those owned privately. Other enterprises are the Government mines and the manufacture, transport, and sale of the product of the Government salt monopoly.

At the head of the military division of the administration is the Department of War, of which the chief is the Lieutenant-General Commanding the Army. The department is divided into nine sections: general, the infantry, artillery, engineers (military administration), medical service, general staff service, cavalry, and topographical service.

The Department of Marine administers besides the naval forces, beaconage, pilotage and hydrographical service, and magnetic and meteorological observatories.

LOCAL GOVERNMENT

The administration by the Dutch of the vast area of Netherlands India, at any rate in theory, varies very much in intensity in different localities according to the relationship subsisting between the government at Batavia and the natives of the particular region. While the native political and social organization is everywhere overlaid with the Dutch administrative system the latter in many places constitutes only the thinnest veneer.

Internationally, Dutch power may be supposed to be paramount everywhere, even in the remote and inaccessible parts of

Borneo and New Guinea. But apart from these few places, which can only be described as spheres of Dutch influence, Netherlands India can be divided into two kinds of territory : (a) Government territory, where Dutch power is nominally as supreme as in Holland ; (b) territory where the natives still enjoy the right of self-government, and where the ordinances and civil service of the government at Batavia can only operate as far as they are compatible with that right. The relationship of the Batavian Government with the latter is regulated by the Self-government Ordinance of 1914.

Territories under Direct Rule

The territories under the direct rule of the Dutch in 1914 comprised the following : Java, excepting the two principalities of Solo and Jokyakarta (see p. 254) ; Bali and Lombok, with a modified arrangement in Gianjar and Karang Asem ; the residencies of Tapanuli, Jambi, Palembang, and Benkulen, and the government of Sumatra West Coast and the Lampongs in Sumatra ; the southern and central districts of Borneo ; Makassar and Bonthain at the southern extremity of the south-western arm, and the Gorontalo and Menado districts of the residency of Menado, in Celebes ; the middle and southern groups of the Moluccas, and the southern half of New Guinea. (For a complete list of the Governments and Residencies, see p. 260.) Nominally the Dutch fiscal and other administrative machinery is in operation in the above-mentioned places, but in fact this is far from being the case.

Native Self-government

It is frequently stated by Dutch writers, quoting from the Constitution of 1854, that the policy of the Dutch, wherever possible, is to leave the work of government in native hands, and to substitute direct rule only where native rule has proved unsatisfactory.

The regions where the natives enjoy self-government are roughly as follows : the principalities in Java of Solo and Jokyakarta (see p. 254) ; the old kingdom of Siak and its original dependencies, and Achin and its dependencies, in Sumatra ; the kingdoms in the north of the residency of South-east Borneo and most of the native States of West Borneo ; all Celebes except the south-western and north-eastern extremities ; all the Sunda

Islands except Bali and Lombok ; the northern group of the Moluccas, and the northern half of New Guinea.

The original relationship of the Batavian Government with the native States comprised in the above-mentioned regions was practically that of political alliance, by which the Company may be said to have recognized their independence. During the nineteenth century the Dutch, by means of new treaties, gradually reduced most of them to the level of vassal kingdoms deprived of their international significance by stipulations forbidding diplomatic intercourse with Powers other than Holland. (Many of the vassal princes, however, still considered themselves allies and not vassals of the Dutch.) As a consequence of the constant revision of these treaties the relationship between the parties varied considerably. There were States bound only by the recognition of Dutch supremacy, a feature common to all the treaties, with one or two obligations of a general nature such as the suppression of slavery and piracy, while others, by a revised treaty, were obliged to admit the Dutch to a share in the internal administration of justice and finance. This, at any rate, was the situation on paper ; in fact, the degree of Dutch interference depended almost entirely on the military strength of the particular States.

In the last decade of the nineteenth century, in place of treaties of varying length, a uniform agreement was substituted in most of the self-governing communities. This is known as the ' short declaration ', and contains three articles, of which the first and second embody the recognition of Dutch supremacy, and the third stipulates that all Dutch regulations and commands shall be followed. A combination of the ' short declaration ' and the former detailed agreement, in vogue in Timor and some of its dependencies, is known as the ' Timor declaration '.

Whereas the old agreement bound the ruler only and was in the nature of a political treaty, the new agreement binds not only the ruler but his subjects also for all time, and is in the nature of a legal enactment. Out of 350 self-governing districts about 330 are bound by the ' short declaration ', while in the remaining few (which comprise a considerable area) the old contracts, in a simplified form, still obtain.

The limits of Dutch interference allowed by the third article of the ' short declaration ' are regulated by the Self-government Ordinance of 1914. Generally speaking the attitude of the Bata-

vian administration is that of an overseer. To deal with the all-important question of native finance, for example, the government has instituted district treasuries in many of the self-governing States, and into these are paid the local taxes and all other incomes, while expenses are defrayed according to a budget drawn up by the native government after consultation with the European officials. In 1910 comprehensive regulations were laid down for the management of the treasuries, and in 1911 an Office of Financial Affairs was established whence the central control of the treasuries proceeds. The recent increase in revenue has enabled the native governments to spend money on public works, for which purpose they also receive advances from the Batavian Government, which, however, cannot reclaim its return from States bound by the 'short declaration'. Still, according to official statistics the Dutch seem to be able to have this payment made to them in most cases. The department of Civil Public Works can only act in advisory capacity in self-governing States. One great advance was the placing of the chiefs on the Civil List. Their salaries when not fixed may not exceed 40 per cent. of the total expenses of the State, and are raised as the revenues increase. The accession of a new ruler is always seized as an opportunity for putting the relations between the State and the Dutch Government on a sounder footing.

Native Principalities of Java

The position of the native principalities in Java is the result of a long and continuous intercourse with the Dutch, and possesses features of its own. The Sultans of Solo and Jokyakarta hold their principalities as fiefs from the Batavian Government, whose official, a resident, represents the European Power at the native courts. The princes have no military force of their own, and the Governors of their territory, although nominated by themselves, are finally appointed by the Dutch, and have the unenviable task of having to reconcile the policies of two masters, European and native. Legally, they must give preference to the commands of the Batavian Government. The princes have no right in coinage, and the teak woods, opium-trade, and birds'-nest cliffs in their territories are the property of the Dutch. The rights exercised by the native potentates in the sphere of justice and police are constantly being restricted. In Solo in 1903 they almost disappeared, and on the death of the present Sultan

of Jokya it is expected much of the native system there will be likewise abolished. What power remains to them consists chiefly in their control over native agriculture from which their vassals and officials derive their revenue. They enjoy, besides, certain showy prerogatives which serve to console them for the loss of real authority, and for the upkeep of their magnificent courts they receive large salaries from the Dutch Government.

Direct Administration

Local Governors and Residents.—In the sphere of the European provincial administration there is a curious cross-division of responsibility. The government departments with the directors at their head, and the corps of officials under their control, are taking an increasing share in the internal administration, especially in the sphere of finance and government enterprise, but athwart the departmental system there is a second system, organized locally, with its head in the local Governor or Resident, who, while receiving instructions from the departmental chiefs, is nevertheless responsible not to them, but to the Governor-General. Generally speaking it may be said that the Governor-General entrusts the administrative side of local government to the departments, and the executive to the Residents and Governors. In practice, however, the heads of provincial government, as the Residents and Governors are called, still do much of the administrative work, although the tendency is for it to be taken over by the departments. In Batavia, for instance, taxation is entirely in the hands of the latter, while as recently as 1913 the Resident in Banka was relieved of the control of the tin mines.

The duties of the heads of provincial government were confirmed by an ordinance of 1867, but, although this has been amended on several occasions, it no longer gives a satisfactory idea of their present sphere of work. All government officials, including natives, are under their control, and some of the lower European and native officials are appointed by them. As they have to enforce general ordinances they are the local chiefs of the police, civic guards, and of other bodies not belonging to the army. When using the military they have to act in co-operation with the commanders. They have also certain responsibilities in connexion with local finance.

Besides these executive duties they have somewhat ill-defined

legislative powers, restricted, however, to the making of by-laws enforced by the police, and a judicial authority enabling them to deal with infringements. The full account of their judicial power is given below, as also is the effect on their legislative authority produced by the recent creation of local self-governing bodies. In Java and Madura there are seventeen residents, and in the Outer Possessions, besides fifteen residents, Achin, Sumatra East Coast, and Celebes have governors, and Billiton an assistant-resident (for list, see p. 260). In Achin an army officer is at the head of the local government and combines the control of civil and military affairs. Everywhere the activities of the heads of provincial government vary in accordance with the degree of intensity of Dutch power.

Provincial Secretaries.—The Resident is assisted by a ‘ provincial secretary ’, by whom he is usually succeeded. At one time the Provincial Secretary held other offices, such as notary, auction master, and cashier, and where these functions have not been undertaken by departmental officials, they are still performed by him. Some heads of provincial government in the Outer Possessions have an Assistant Resident to supervise self-governing districts, while in Palembang there is a special official for native justice.

Assistant Residents and Controleurs.—The province is subdivided into divisions. At the head of each, in Java and Madura, is an Assistant Resident, and in the Outer Possessions, in some cases, a Controleur. In most places there is a separate chief for the division in which the provincial capital is situated, but in some it is governed by the head of provincial government. The divisional chiefs receive a salary, their percentages having been abolished in 1866. Since 1902 the heads of provincial government have issued their instructions. The divisional chiefs are often notaries and registrars ; they administer justice and control the police, but, except by special decree, have no legislative powers.

The further division of the province varies in different regions. In Jambi and Banka there is nothing smaller than the division ; the rest are subdivided entirely or in part. While in the Outer Possessions the Controleurs, with the exception of the one in the division in which the capital of the province is situated, are independent chiefs of the local administration, in Java and Madura they are merely subordinates of an Assistant Resident, from whom they take all their instructions.

The chief duty of the Controleur is to keep in daily touch with the native chiefs with a view to ascertaining economic and other conditions, about which it is their function to inform their superiors. In Java they were originally chiefly concerned with the promotion of government cultures, but soon, as a consequence of the law of 1915, the remnants of this form of culture will entirely disappear. Culture percentages were abolished in 1866. The Controleurs used also to control the *landrente*, but by the regulations of 1896 and 1897 this is now mainly in the hands of the village chiefs and collectors. To-day they are concerned with the administration of the agrarian law and industrial taxes. They must report all crimes coming to their notice, but only administer justice in certain cases. They have no legislative authority.

Outside Java and Madura the Controleur's power is more extensive, and upon him falls the task of administering justice and police. As he has no reliable native regent whom he can use as an intermediary, he himself comes much more in contact with the natives than officials of similar rank in Java and Madura. 'Aspirant-controleurs' are appointed to work under an Assistant Resident or a Controleur if they are not temporarily in charge of a sub-division, while candidates for the colonial civil service from Holland are termed probationers.

Of other officials, generally natives, the most important are the assistants who are used by the Dutch mainly in self-governing districts to act as a link between the government and the native chiefs. These officials are now employed in Menado, Celebes, Ternate, Amboina, and Timor.

Native Regents.—Alongside the European is a second system, the native, which, however, is an integral part of the system of direct administration. By Article 67 of the *Regeerings Reglement* of 1854 the natives are as far as possible to be left under the government of their own chiefs, appointed or recognized by the Dutch Government. Only those chiefs who are appointed are included in the administrative system of the government. These are called Regents, and are found almost entirely in Java and Madura, which is divided into 70 regencies. The institution originated in the time of the old Javanese kingdoms, in which the provinces were ruled by a *bupati* who rendered homage, paid tribute, and marched in their suzerain's army. When the Company had gradually annexed many of these provinces, the tribute of the regents in the form of contingents and forced

deliveries was diverted to the Dutch. These Regents were not theoretically subject to Dutch commands, but signed agreements as independent princes. Daendels, however, made them government servants subject to instructions of the heads of the provincial government, and their position was further depressed by Raffles, who endeavoured to relieve them of their financial duties. Van der Capellen restored them to much of their former importance, and used them to work the culture system, under which they were remunerated by the grant of official lands carrying with it a right to the labour of the tenants. In 1854 the *Regeerings Reglement*, by Article 69, enjoined the Governor-General if possible to fill the office vacated through the decease of a regent by the appointment of one of his sons. In 1900 an increase of salary was granted to the Regents to remunerate them for the loss of the right of employing forced labour, and since 1907 they have had no percentages on cultures, but are now supplied with an official residence. Since 1911 the Regents have had a society known as the *Perhimpunan*.

The regents are still mostly of high birth, some being princes. They are appointed and dismissed by the Governor-General on the nomination or advice of the resident. Their rank is indicated by sunshades and other insignia. The regent is the head of the native administration in the regency, and is immediately responsible for the natives. He has to keep well informed the head of the provincial administration, who listens to his advice but decides independently. He has nothing to do with the collection of taxes, but has the management of the police among the natives, and also acts as a judge. He has no legislative power in theory, but actually many of his regulations have the effect of ordinances. The Mohammedan religion is subject to his supervision.

Other Native Officials.—To assist the regent in the performance of his office a native of high birth is appointed and salaried by the government as *patih*, an official who corresponds to the governor of the self-governing princes. In most of the regencies the *patih* acts also as a *patih-wedono* or chief of the district in which the capital of the regency is situated. The regency and the division with an assistant-resident at its head are usually coincident, but in Java there are five divisions with two regencies each, and a few cases of a regency comprising two divisions or even three. In this latter case there is a *patih* in each division besides a district chief. In the four divisions of old Batavia

before its union with Krawang in 1901 there were no regents, but recently independent *patih*s were instituted.

Only the three *sagi* chiefs of Great Achin, who control the district chiefs, and the stadtholders of Bangli and Gianjar in Bali, now called regents, resemble the regents of Java. The regents of Padang and Indrapura, abolished in 1913, were originally harbour-masters, the regents of South Celebes are district heads, and those of Amboina village chiefs, whose salaries are much less than the *bupatis* of Java. While the regency organization of Java is seldom found on the Outer Possessions, the lower ranks of the administration are much the same in both places.

At the head of the districts into which the regencies and the territories of the four independent *patih*s in Java and Madura is a *wedono*, whose duties on a limited scale are almost identical with those of the regent. The *wedonos* receive a salary, can claim a house, and, in places where compulsory coffee culture still exists, receive percentages. The districts are further subdivided, and there are more officials called assistant-wedonos, who receive a salary from the government.

Outside Java and Madura the native organization is not so complete, and varies very much in different parts. In many districts, particularly where there is widespread native self-government, as in Sumatra East Coast, West Borneo, Ternate, and Timor, the government district and sub-district organization is not required. In places such as Bengkalis, Riouw, Banka, Billiton, and South Celebes, where there are village chiefs and no native organization, these chiefs are placed in the lowest rank of the government administrative system instead of being the independent heads of the village communities. Other native officials whom the government has used as district chiefs are the heads of the *ulebalangs* in Achin, *kuria* chiefs in Tapanuli, and *pasirah* chiefs in Benkulen, Palembang, and Jambi. In certain places, as in the south of Sumatra, where native district government did not exist, the Dutch have introduced it, while in 1915, in Sumatra West Coast, the district chiefs of the native organization were diminished in number and the sub-district chiefs increased. Wherever possible, native institutions still possessing vitality, are used for purposes of government.

Natives like the Makassarese, the Buginese, and others from Celebes, colonies of whom are found in various parts of the

archipelago, are not included in the native administration, but are under their own chiefs, who are directly responsible to the Dutch. In the same way there are chiefs in the Chinese and Arab quarters. These chiefs sometimes receive salaries, and their instructions are issued directly to them by the residents. At some capitals Chinese councils have been formed which undertake tax-collecting and police work. Where Oriental aliens are not numerous they are subject to ordinary native organization.

Administrative Divisions

(a) Governments

Achin and Dependencies (Sumatra)

Sumatra West Coast

Celebes and Dependencies

(b) Residencies in Java and Madura

Bantam	Rambang	Kedu
Batavia	Surabaya	Jokjakarta
Preanger Regencies	Madura	Surakarta
Cheribon	Pasuruan	Madiun
Pekalongan	Besuki	Kediri
Semarang	Banyumas	

(c) Residencies in Sumatra and adjacent islands

Tapanuli	Palembang	Riouw and Depen-
Benkulen	Jambi	dencies
Lampongs	Sumatra East Coast	Banka and Depen-
		dencies

(d) Residencies in Borneo

West Borneo, South and East Borneo

(e) Other Residencies

Menado (Celebes).

Ternate and Dependencies (Northern Moluccas; also including northern New Guinea).

Amboina (Southern Moluccas; also including southern New Guinea).

Timor and Dependencies (Lesser Sunda Islands).

Bali and Lombok (Lesser Sunda Islands).

(f) Assistant Residency

Billiton.

The Desa

The basis of native society on which the upper structure of the European and native systems of administration is imposed is the village community or *desa*. The headman of the *desa* is generally chosen by the villagers themselves subject to the approval of the resident, although the practice varies in different localities. His administrative functions are chiefly concerned with a village police system something like the old 'watch and ward' of the Saxons and with the collection of taxes. In Java he collects the *landrente*. The government police system stops at the *desa*. In his duties the headman is sometimes assisted by the village priest and four or five of the elders. Until recently, at any rate, he received as remuneration a percentage of the taxes he collected.

Reforms of Local Government

In the last forty years there have been several reforms in provincial government, among which were the substitution of salaries for payments in land and labour, a policy begun in 1866, the abolition in 1871 of the Preanger system, which left the regents of that region without effective supervision, the weeding out of native government in 1874, and of the policy of retrenchment in the European administration, begun in 1900.

Urban and District Self-government.—A very important change in the system was the institution of local self-government, which originated in an amendment to the constitution in 1903, the principles being set forth in a royal decree of 1904, and elaborated in an ordinance of 1905. The object of the change was to give the local populations some measure of control over local revenue and expenditure, and an opportunity for local enterprise in the institution and maintenance of public works. It was enacted that provincial, urban, and district councils could be constituted by means of separate ordinances. There was in 1914 only one district council, namely that for the agricultural (tobacco) area in the residency of Sumatra East Coast, but urban councils have been set up at sixteen towns: Batavia, Meester Cornelis, Buitenzorg, Semarang, Bandung, Cheribon, Tegal, Pekalongan, Magelang, Kediri, Surabaya, Blitar in Java, Palembang, Padang, and Medan in Sumatra, and Makassar in Celebes. There are fifteen provincial councils, as follows: Bantam, Rembang, Besuki,

Banyumas, Madiun, Madura, Batavia, Preanger Regencies, Cheribon, Pekalongan, Semarang, Surabaya, Kedura, Kedu, and Pasuruan, all in Java and Madura.

The councillors represent the Europeans, natives, and alien Orientals, the first of which classes preponderates. This is due to the number of seats occupied *ex officio* by the members of the local administrative service. Other councillors must possess certain property and residential qualifications. In the urban councils the Europeans are generally elected, but in the provincial councils the European officials and all the natives are appointed. The head of the provincial government presides over the provincial councils, while an assistant-resident is chairman in the urban councils.

The powers of each particular council are delimited by its own instituting ordinance. They include the maintenance of public works, water supply, drains, administration of government domains, fire brigade, cemeteries, slaughter houses, ferries, markets, public health, &c. The councils take over much of the legislative power formerly exercised by the resident, but it is only residual, and comprises those matters only not provided for by the ordinances of the Governor-General. The power of enacting police by-laws with the consequent jurisdiction also devolves upon the councils.

The most important privilege of the council is its control over local finance. A subsidy based on average expenditure previous to 1903 is paid annually by the government, together with occasional contributions for the upkeep of roads. In addition, the councils have restricted powers of levying local rates or increasing the existing government taxes. The local taxation of the native population is only permitted in cases of great urgency. The government subsidies are said to have proved inadequate for the needs of the growing population, and until the powers of taxation at present exercised by the government can be delegated to the local authorities, an additional sum equal to the total amount of their contribution to the colonial exchequer for the year previous is annually paid to them. In Makassar 20 per cent. of the slaughter taxes are assigned to the local council.

Through his subordinates, the *ex officio* members, the Governor-General is able to exercise a close control of the councils, of whose powers he restricts too wide a use, and amplifies by

ordinance or causes to be remedied by local by-law any omission. The police regulations must first be submitted for the approval of the Director of Justice.

Provincial Self-government.—More recently, in 1909, another sweeping reform of provincial government was set on foot. It is proposed in this new scheme to effect the gradual division of Netherlands East India into twelve governments, each with its own exchequer but without other autonomy. At the head of each of these big divisions will be a governor with a provincial council to deal with financial matters. At the same time the number of officials is to be reduced, while they are to be better paid and more highly educated. The native government is to be given a greater degree of independence, and a new class of controlled native officials in Java, to be called adjunct-regents, is to be placed at the head of the native government thus made independent. By 1914 these plans were complete, but, so far, all that has been done is to begin the system of training at the government school at Batavia. The effect of these changes will be to modify the tendency to over-centralization which characterized the administration towards the end of the nineteenth century.

JUSTICE

There are two kinds of justice in Netherlands India—that administered through the tribunals of the government, some of which are presided over by natives, and that administered through independent native tribunals. The complete government judicial system does not cover the whole territory subject to the direct administration of the Dutch, and inside this area there still remain many independent native tribunals.

Again, there are two bodies of law in vogue—that consisting of the ordinances of the Batavian government which are framed in accord with the Code Napoléon, and the native *adat* or customary law in so far as it is not opposed to equity. The Governor-General, with the assent of the Council of India, can apply the ordinances wholly or in part to any section of the native population.

Whereas the independent native tribunals administer the *adat* only, the government tribunals administer both the ordinances and also the *adat*.

The respective spheres of the two jurisdictions, independent

native and government, are at present roughly as follows. Java and Madura, with certain exceptions in the Principalities ; the Lampongs, Sumatra West Coast, and Tapanuli in Sumatra ; Banka and Billiton ; the southern half of South and East Borneo, with two districts in West Borneo, and several small districts in Menado and Celebes, are within the jurisdiction of government tribunals. The rest of Netherlands India, by far the greater area of the two, is subject to independent native tribunals. The independent native tribunals are so numerous and so various in organization that a complete description is impossible, but the following is a brief account of the government system.

Government Justice

As already stated, the government tribunals administer both the justice based on the ordinances and that based on the *adat*, and for convenience the population amenable to government tribunals is divided into two groups. The first of these groups is composed of Europeans and those associated with them, including Japanese and all Christians. There is a special set of regulations for native Christians. In the second group are the natives and those associated with them, as Arabs, Moors, Chinese, and other non-Christians.

If the social and intellectual standing of a person belonging to the second group makes it desirable that he should be transferred to the first, this can be done by a special resolution. The distinction between the two groups is not absolutely rigid, and much of the European civil law (excepting laws relating to inheritance and marriage, &c.) has been applied to the Oriental aliens of many parts of the colony.

The distinction was originally made in the interests of equitable treatment, and to this day this justification still exists, but the inequalities arising out of the existence of two standards, particularly in criminal matters, often in the same court, have caused an agitation on the part of natives in favour of the substitution of a single standard. This has already borne fruit in the institution of a new class of judges known as *landrechters* who deliver judgement in minor criminal cases for all classes of the population.¹ Moreover, a new penal code with a uniform system of punishments for offenders of all races has already been

¹ In 1914 *landrechte* were set up at Batavia, Semarang, and Surabaya.

published, and the civil law was recently in process of re-organization with a view to a greater uniformity. At the present time, therefore, justice in Netherlands India is in a state of transition.

The Courts

The highest judicial board in Netherlands India is the High Court of Justice with its two chambers in Batavia, the president of which is appointed by the sovereign. The High Court is a court of first instance besides in the highest resort a court for administering a kind of *droit administratif*. It is an appeal court for civil suits which have already been through the Councils of Justice, for suits involving large sums of money and for certain unusual criminal cases which have been tried previously by the Councils of Justice. In cases of pardon, dispensation, and emancipation the Governor-General is present.

In Java and Madura the next in rank are the Councils of Justice in Batavia, Semarang, and Surabaya. The jurisdiction of these courts is very extensive; that at Batavia comprises Bantam, Batavia, Preanger Regencies, and Cheribon in Java, the Lampongs, Palembang, Jambi, Banka and Dependencies, Billiton and West Borneo; the Council of Justice at Semarang comprises in its jurisdiction Pekalongan, Semarang, Banyumas, Kedu, Jokyakarta, Surakarta, Rembang, and Madiun, all in Java; the jurisdiction of the Council at Surabaya includes Surabaya, Kediri, Pasuruan, Besuki in Java, besides Madura, Bali and Lombok, and South and East Borneo. These Councils of Justice are courts of first instance for all crimes committed by Europeans and prominent natives besides maritime matters. They review criminal cases which have been through the *land-raaden* of Java and Madura, and possess an appellate jurisdiction for cases which have been through the residency courts in Java and Madura and the Outer Possessions, and civil cases from the *landraaden* involving a value not less than 100 florins.

In Java and Madura at the head-quarters of the resident or assistant-resident, as well as at a few other towns, there is a residency court of first instance for criminal cases involving a fine up to 500 florins or three months' imprisonment, and a restricted jurisdiction in civil cases. The court is primarily for the European category, and is presided over by the judge, a European lawyer, of the local *landraad*. The Resident exercises

a police jurisdiction over the natives, but in some places he has been supplanted by the local government authorities.

The *landraad* is a court held in the capitals of all provinces and their divisions, and at several other towns. The court consists of a European chairman assisted by native chiefs and law officers. These constitute the ordinary courts for the natives, and they are empowered to deal with all native civil suits and most criminal cases.

In the regencies and districts there are courts presided over by the native regents and *wedonos*, where judgement is delivered in minor civil and criminal cases affecting natives.

In the principalities of Java justice is administered by the government tribunals wherever it is not administered by the Susuhunan of Surakarta and Mangku Negara, in criminal and civil matters respectively ; by the Sultan of Jogyakarta in the civil affairs of his relations, courtiers, and officials ; by the native judges of the Sultan of Jogyakarta in civil cases and the Surambi at Jogyakarta in divorce cases.

In the Outer Possessions justice is administered to those amenable to government tribunals by Councils of Justice, like those in Java, at Padang, Makassar, and Medan, which between them comprise in their jurisdictions all persons in the Outer Possessions not amenable to the Councils at Batavia, Semarang, or Surabaya ; secondly, by residency courts in all the provinces of the Outer Possessions ; thirdly, in place of the regency and district courts of Java, civil cases are judged by native officers of justice, whose powers and organization differ in different localities.

Wherever there is a *landraad* there is also an ecclesiastical court with the native *pangulu* of the *landraad* as president and from three to eight priestly members besides. These are all appointed and dismissed by the Governor-General. The jurisdiction of these courts is co-extensive with that of the *landraad*, and deals with religious differences and suits arising from marriage inheritance, &c.

POLICE

In Netherlands India there are two kinds of government police, the general police and the armed police, both controlled by the Department of Inland Administration.

The general police was in process of complete reorganization

so recently that there is little information as to its composition. Its duties are numerous and varied. In communities where there is no night patrol organized by the inhabitants for the duties of 'watch and ward' this is provided, with the necessary equipment, from the ranks of the general police. In the stricken provinces of Java the police are engaged in preventing the spread of plague, and in Bantam their number has been recently increased to prevent the unlawful use of opium.

After the numerous campaigns carried out by the Dutch in recent years it was found necessary to provide a force to take the place of the military which had been withdrawn from conquered territory. For this purpose various existing corps were united in one body of armed police with a chief in the Department of Inland Administration. The corps consists of 22 divisions, 20 of which are in the Outer Possessions and two in Java. Each division is commanded by a pensioned or active military officer, except in Acheh. The division is divided and subdivided according to temporary requirements, and the detachments are commanded by European or native commanders according to their size and importance. The native detachment leaders are chosen from the non-commissioned ranks of the army, and are Menadorese, Timorese, or Amboinese.

The rank and file are recruited from all nationalities, and it is usual to station divisions in some place other than that of which they are natives. The detachment at Chilegon in Bantam, the division in Menado, and the detachment in New Guinea have to be composed as far as possible of Christian natives.

The equipment of these police consists of a Beaumont carbine and a sword.

DEFENCE

A Royal Commission, which in 1912 investigated the state of Netherlands Indian defences, in 1913 issued a report in which it was stated that the very existence of Holland depended on her colony. The commissioners agreed that their main security lay in the favourable treatment of foreigners and foreign capital, but they recommended the maintenance of military and naval forces sufficient not only to keep order within their borders but also capable of resisting the dangers nearest at hand and of constituting a formidable support to any friendly power interested in maintaining the *status quo* in the East.

Army

The army of Netherlands India is a formation independent of the military forces of Holland ; it is maintained by voluntary recruitment in Holland and India, and its commander-in-chief is the Governor-General. At the end of 1914 its strength was stated to be 38,326 of all ranks.

The officers who are all Europeans with the exception of a few of other nationalities, are Dutch who have been recruited in Holland or colonial born. Their number was 1,285.

Of the non-commissioned officers and men, 8,678 were described as Europeans, but of these 1,690 had native blood, 758 were Germans, while nearly 6,000 came from Holland. There were besides 28,543 native troops, of whom 9,282 were Amboinese, 16,758 Javanese, and the rest made up of Sundanese, Madurese, Buginese, and Malays.

In the infantry there were 29,685 non-commissioned officers and men, of whom 4,813 were in the European category ; the officers numbered 665. The infantry comprised the infantry staff, 21 field battalions, 4 machine gun companies, 3 dépôt battalions, 9 garrison battalions, and 6 garrison companies, besides training schools and commissariat. The *marechaussée*, a special corps originally used in Acheh, is also on foot.

The cavalry, with a total strength of 937 non-commissioned officers and men and 32 officers, comprised the cavalry staff, 4 field squadrons, 1 dépôt squadron, and 1 squadron of life-guards.

The artillery strength was put at 2,760 non-commissioned officers and men and 121 officers, and was composed of the staff, 4 batteries of field artillery, 4 mountain batteries, and 10 companies of siege artillery. Besides the batteries there were several magazines, arsenals, and workshops.

In addition to the three fighting arms there are a corps of engineers, a medical service, and various other subsidiary services.

In 1914 there were about 25,000 troops, with their headquarters in Java. These included, at the beginning of the year, 16 field battalions, all the machine gun companies, 3 dépôt battalions, including the one divided between the principalities of Surakarta and Jokyakarta, all the cavalry, including the squadron of life-guards distributed at the two capitals of the principalities, and most of the artillery. Four companies of siege artillery together forming a battalion constituted part of

the defences of Batavia ; one siege company was stationed at each of the following places : Chilachap, Surabaya, Batujajar ; and one quartered among the towns of Bandung, Sumedang, and Nagrek. Although the head-quarters of these forces are in Java, particular units are often stationed temporarily outside the island, as in 1914, when one battalion went on an expedition to Borneo, and at the end of that year was still there.

In Acheh there were at the end of 1914, 4,779 troops, and this force included 1 field battalion, 3 garrison battalions, with a company of siege artillery at Sabang. In the rest of Sumatra there were 2,478 troops, all infantry.

In the two residencies of Borneo there were 2,173 troops, in Timor and Dependencies, 415 ; in Celebes and Menado, 1,423 ; and in Amboina and Ternate, 343, all infantry.

According to the report of the State Commission a fighting force capable of dealing with military problems in Netherlands India, including that of withstanding an attack of a European army, should be composed in two equal proportions of the better and worse elements. This, in other words, means that the Europeans and Amboinese, whose fighting values are about equal, should together equal the number of other natives. However, when various districts in the Outer Possessions become more tranquil it will be possible to make more extensive use of the inferior natives in garrison units, which already in 1912 were composed of the inferior element in a proportion of 2·8 to 1. Owing to the chronic deficiency of Europeans it was suggested that the number of Amboinese and native troops of the same standard as Timorese should be substituted for Europeans in garrison units. As an Amboinese costs as much as a European, and as the European non-commissioned ranks would have to be increased, there would be no economy in this plan.

The commission suggested various financial expedients for the proposed improvement in the defences of Netherlands India, involving increased taxation in either India or Holland.

There are various other armed forces, not, however, immediately subject to the army administration. One of these is the civic guard, which, in theory, is supposed to exist at all the provincial capitals. At the end of 1914 there were detachments at Batavia, Semarang, Surabaya, Jokyakarta, and Surakarta in Java, and also at Padang in Sumatra, Makassar in Celebes, and in the residencies of Amboina and Ternate. The civic guards are supposed in normal times to assist in preserving law and

order at their home stations, and here they are under the command of the heads of provincial government. In times of unrest, however, the Governor-General can mobilize them for service wherever necessary. For purposes of maintaining discipline, local councils are appointed by the war department. All European subjects between 18 and 45 years old, and Malays, Moors, Bengalese, and Buginese between 16 and 40 are liable for service. There are numerous exemptions, including many professions and civil servants, and these pay an annual contribution based on their incomes for the purpose of buying uniforms for the guards. The total strength of the force at the end of 1914 was roughly 3,180 men with 117 officers.

The Legion of Mangku Negara is an historic formation, which, at the end of 1914, consisted of a battalion of infantry and a half squadron of cavalry, together numbering 764 men with 26 native officers. The only other native units at the government's disposal are the three *barisans* of Bangkalang, Pamekasan, and Sumenep in Madura, which together muster 1,367 foot soldiers with 38 native officers.

Navy

The naval service of the colony has two branches, the Indian Military Marine, and the squadron of the Dutch Royal Navy. The former is administered by the Governor-General and the Netherlands India Marine Department; the latter, while at the disposal of the Governor-General and maintained by him during its sojourn in the East, is administered by the Dutch Minister of Marine. At the end of 1914 the Indian Military Marine consisted of 4 old gunboats, 9 torpedo boats, the oldest of which was built in 1887 and the most recent in 1906, and 5 survey ships. At the same date the squadron of the Dutch Royal Navy consisted of 4 armoured ships, the *Seven Provinces* being of the most recent construction (1908), and 6 torpedo-boat destroyers, most of which are of comparatively recent construction.

FINANCE

Revenue

The revenue of the government of Netherlands India is derived from taxation, the sale of government products, monopolies, government industries, and other sources. It is interesting to note the change in the fiscal policy of the government as it is reflected in the comparative receipts of taxation and the sale of

products. In 1875 the receipts from taxation amounted to about 20 per cent. of the total revenue, and the sale of products to about 50 per cent. According to the estimated figures of 1916, taxation was expected to yield 40 per cent. and the sale of products only 12 per cent. The receipts from monopolies have within the last fifty years more than doubled, and now constitute about 20 per cent. of the total revenue.

• Taxation

The most important of the direct taxes is the *landrente*, which is imposed on land held by native right in Java and Madura and consists of a proportion of the produce, rice, nipa palm, &c. It was first instituted by Thomas Stamford Raffles. There are taxes of a similar kind in a few places in the Outer Possessions, such as the tithe of the rice yield in Celebes and the tax on the rice-fields of Bali and Lombok.

Land held by General Ordinance, Royal Decree, or by a freehold right conferred by Raffles, is subject to a ground tax or *Verponding*. It is imposed throughout the whole colony.

A tax on industrial and other incomes was first imposed by Raffles for the purpose of obtaining a contribution from those natives not engaged in agriculture, and therefore not liable to *landrente*. It is now levied on natives and Oriental aliens, and has been extended to the Outer Possessions.

A tax on business incomes is paid by Europeans, and one on professional incomes by both Europeans and Oriental aliens. Europeans and those in the same category also pay a sumptuary tax assessed on yearly rent, furniture, and vehicles.

There are many other direct taxes of special kinds, varying in character in different localities. There are, for instance, a tax on spice plots in Banda, one on diamond mines in Borneo, and numerous capitation taxes in other places. A tax of especial interest is the poll tax imposed on those who have been exempted from statute labour.

In Java the compulsory labour of the natives is used for some or all of the following purposes : the upkeep of roads, the transport of road-making materials, the maintenance of dams, waterworks, embankments, and canals. The maximum number of days which can be exacted differs in different places, and varies, as a rule, from 20 to 10, although in two localities it is 6 and 3 respectively. A day's work, including travelling and rest, cannot exceed 12 hours, and except in Preanger the native cannot be

compelled to work more than 8 miles away from his home. Forced labour for the benefit of native chiefs and officials except in the case of village headmen is prohibited. The inhabitants of free *desas*, if registered as such by the Governor-General, are exempt from this labour. Those exempt are subject to an annual capitation tax, which varies in amount in different localities from 1 florin to 2½ florins. Dutch writers are inclined to be apologetic when dealing with this institution, and it appears that movements are on foot to raise sums which will enable the government to do without forced services. In all parts of the Outer Possessions this institution is in vogue, and the labour comprises all kinds of public services, in some places including, for instance, the guiding and protection of travellers. Only in Makassar, apparently, is a poll tax imposed in its stead.

The indirect taxes comprise the ordinary legacy, transfer and stamp duties, the tax on gambling establishments, besides the dues on public sales, which are all conducted by government auctioneers. There are various excise imports, on native spirits in Java and Madura, on Javanese, Chinese, and foreign tobaccos and petrol, and matches (1913). All over Java and Madura and in many places in the Outer Possessions, a tax is imposed on the slaughter of domestic animals, while outside Java there are numerous local taxes levied on different products.

Within an area designated as the 'customs sphere' in which the customs duties¹ are levied under the auspices of the Dutch administration (practically the whole colony), import duties from 6 to 12 per cent. *ad valorem*, besides fixed charges according to weight, are levied on numerous articles in the following places: Java and Madura; the government of Sumatra's West Coast, the residency of Tapanuli, the Singkel district of the Government of Achin and Dependencies, the residencies of Benkulen, the Lampongs, Palembang, in Sumatra; the residency of Banka and Dependencies, the assistant-residency of Billiton, and the residency of South and East Borneo. The chief exemption from this tariff applies to all goods with the exception of spirits exported from other parts of Netherlands India. In the places above mentioned an export duty is levied on hides, petroleum products, tobacco, tin, and birds' nests.

In the Outer Possessions, besides those regions already enumerated, there are others which are included within the

¹ The description of the import and export duties is from *Regeerings Almanak*, 1913.

customs sphere. They are as follows : that part of the Government of Achin and Dependencies not already mentioned, the residency of Sumatra East Coast with the exception of the Siak coast, with which is included the Siak River, Banka, and Kubu and adjacent islands, certain districts of the residency of Riouw and Dependencies, and the residency of Jambi, in Sumatra ; the residency of Menado and the Government of Celebes and Dependencies in Celebes, eight districts of the residency of South and East Borneo, the residencies of West Borneo, Amboina, Ternate, and Dependencies, Timor and Dependencies, and Bali and Lombok.

With the exception of a few special provisions, mainly applicable to the importation of salt, the tariff of import and export duties already described also applies to these places. But, except in the case of Bali and Lombok, the Governor-General by virtue of his right under Article 5 of the Tariff Law, has levied an additional export duty varying from 6 to 10 per cent. *ad valorem*, and in a few cases consisting of fixed charges according to weight, on articles exported from the remaining places. These extra duties are arranged according to locality into four tariff tables, in three of which they are levied on not more than a dozen articles, and in the fourth, Achin and Dependencies, on as many as twenty.

There is no differentiation of duties in favour of particular nations ; they are raised for revenue purposes only.

The task of collecting the taxes falls chiefly on the Department of Finance, although it is often supervised by the local officials of the provincial government. The *landrente* in Java and Madura is subject to the control of the Department of Inland Administration and the import and export duties are, in most places, collected by the local officials of the same department. In certain places any official is empowered by the Department of Finance to collect excise duties. A few taxes in Java are farmed, as the duty on gaming establishments; in the Outer Possessions the number of farmed taxes is much greater.

Monopolies

The chief government monopoly is opium. The consumption of this drug is variously regulated in different parts of Netherlands India. In some places it is totally prohibited, while in others it is forbidden to natives only ; elsewhere there are

licence systems in vogue and in some places the consumption is unrestricted. Within a limited area, mainly in Achin and Dependencies, the sale is farmed out, but is supervised by a staff of inspectors belonging to the Department of Finance, who enforce regulations and prevent smuggling. The state monopoly is a recent creation and it is only lately that it embraced the greater part of Netherlands India. At the head of the administration is the chief of the Opium Service, and his subordinates include four controleurs with many dépôt-holders. Many Chinese are employed.

In 1903 the Government began to substitute state ownership of pawnshops which had hitherto been in the hands of private individuals, generally Chinamen. In 1913 government shops were in existence all over Java and Madura, though the farming system survives in the Outer Possessions. To administer this service there is a special staff of officials consisting of a chief, various inspectors, and pawnshop controleurs.

In Java and Madura, in both residencies of Borneo, and in most of the government territory in Sumatra, the Government possesses a monopoly in the sale of salt. - In other places the manufacture is forbidden but importation is unrestricted, and elsewhere, as in Celebes, the Lesser Sundas, the Moluccas, and New Guinea, both the manufacture and importation are quite free. The salt is sold loose and in briquets ; for storage purposes there are a number of dépôt warehouses controlled by European warehouse masters, and for purposes of sale the Government possesses auction warehouses with staffs of European and native officials.

Government Cultures and Services

Of all the cultures originally worked by the Government for their own profit, only coffee now remains, and this in recent years has been confined to Java. There are other government cultures of a more recent origin, such as quinine and rubber, of which the former has proved the more profitable. Teak and wild timber forests are also exploited by the State. The tin mines of Banka are worked by the Government and the product is sold in European markets ; the coal from Ombilin in Sumatra, however, is for purely local consumption.

There are, further, certain public services which the Government endeavours to work at a profit to itself. In railways and

tramways alone the State, at the end of 1914, had invested over twenty-one millions sterling, and in that year made a profit of over one million and a quarter. In 1915 the profit was roughly £1,500,000. Posts, telegraphs, and telephones, on the other hand, have so far, except in one or two years, shown a deficit.

The Budget

The budget of Netherlands India is composed of the maxima of expenses for a period known as the 'service year', and the assignment of means to meet these expenses.

The estimate of the expenses has two columns, in which respectively are placed the colonial expenses in Holland (interest, pensions, leave-pay, army, navy, &c.), and the expenses in India. Across this division according to locality there occurs a further division of expenses under departments, in which besides the nine government departments are included expenses under the two heads of governing and high boards and local self-government. The items of the estimate are set out in some detail, and in the budget of 1915 there were 203 entries in the column of expenses in Holland and 986 in that of expenses in India.

In every departmental division there is provision for unforeseen expenses, and further opportunity for revision is afforded in the supplementary estimates and the statutes of adjustment. The revenue does not appear in the budget in detail but it is merely indicated what receipts are to be assigned to cover the various expenses.

The two columns of expenses are prepared respectively by the Minister of the Colonies in Holland and by the Governor-General and his assistants in India. They are then submitted for the approval in legal form, of the States-General. A somewhat belated commentary on the budget is afforded by the colonial accounts prepared by the departments of colonial government and audited by the Chamber of Accounts at Batavia. When the actual expenses in Holland have been added by the Minister of the Colonies the accounts and a bill based upon them are sent to the Second Chamber. The approval of the States-General is not legally necessary. At one time these accounts were not produced until a period as great as twenty years had elapsed since the year to which they referred, but of late they have appeared as soon as three years

after. The balance shown by the accounts and that conjectured in the budget have of course differed considerably. In 1910 an estimated deficit of over 35 million florins (nearly £3,000,000) actually appeared in the accounts as a little less than 10 million (over £800,000). The uncertainty of the yield from government cultures and industries is the main cause of discrepancies between the budget and the accounts.

The figures for the total receipts and expenditure of the ten years, 1905-14, are as follows. Those of 1913 and 1914 are provisional.

	<i>Receipts.</i>	<i>Expenditure.</i>
	£	£
1905	12,970,500	13,851,900
1906	14,110,900	13,961,890
1907	15,483,655	14,464,670
1908	15,837,518	15,943,934
1909	16,457,348	16,738,609
1910	18,459,685	19,285,606
1911	20,709,934	20,815,819
1912	22,545,829	22,240,006
1913	25,856,924	27,055,731
1914	22,910,490	28,306,168

Thus in these ten years there has been a credit balance on only three occasions, while on the others the deficit has varied in amount from over £100,000 to the provisional figure of over £5,300,000 for 1914. The budget for 1917 shows a deficit of nearly £5,000,000. In order to cover these deficits loans on behalf of the colony have in the past been occasionally floated by the Netherlands Government, and in the colonial budget under the head of the Department of Finance there is every year provision for the paying off of these advances. In the budget for 1916 nearly £1,000,000 was set aside for this purpose, and generally the colonial finance is considered quite capable of dealing with its light burden of debt.

During the period for which the balances were quoted there was considerable capital expenditure, averaging nearly half a million annually; in 1913 the expenditure capital and current on government enterprises increased by £1,600,000. This outlay has always appeared in the budget and the accounts, and has largely contributed to the deficit. The Government, therefore, are in possession of assets annually productive of considerable revenue.

The uncertainty of this yield, however, has been described as the weakness of the system. While the revenue from taxation makes gradual progress, the return from government

products is subject to violent fluctuations, and to a lesser degree there is uncertainty about the yield of the monopolies. In 1914 the amount realized on the sale of the government products was roughly £2,360,000, as compared with £4,120,000 of the previous year. A partial recovery was expected in 1916.

Although, therefore, the colony during this period of capital expenditure cannot be expected to contribute to the treasury of the Netherlands, yet it is independent financially. The recognition of this fact by the Dutch resulted in the institution of a colonial council known as the *Volksraad* (see p. 248).

FOREIGN CONSULAR SERVICES

Foreign consular representatives were established in 1913 at various points in Netherlands India as shown in the following table, in which the asterisks indicate representatives of the Powers named in the left-hand column. The list of British representatives is corrected to January 1, 1918, when there were at Batavia a consul-general, vice-consul, and pro-consul; at Semarang two vice-consuls; at Surabaya a vice-consul and two pro-consuls; at Makassar a vice-consul; at Medan a vice-consul and a pro-consul; at Padang a vice-consul, and, in addition to places named in the following table, a vice-consul at Sabang and a consular agent at Kupang.

	<i>Batavia, Java.</i>	<i>Semarang, Java.</i>	<i>Surabaya, Java.</i>	<i>Chilichap, Java.</i>	<i>Medan, Sumatra.</i>	<i>Padang, Sumatra.</i>	<i>Makassar, Celebes.</i>	<i>Menado, Celebes.</i>
Austria-Hungary . . .	*	—	*	—	—	*	—	—
Belgium	*	*	*	—	—	*	*	—
China	*	—	—	—	—	—	—	—
Denmark	*	*	*	*	*	*	*	*
France	*	*	*	—	*	—	*	—
Germany ¹	■	*	*	—	*	*	*	*
Great Britain	*	*	*	—	*	*	*	—
Italy	*	*	—	—	—	—	—	—
Japan	*	—	—	—	—	—	—	—
Norway	*	*	*	—	—	*	*	*
Persia	*	—	—	—	—	—	—	—
Portugal	■	—	—	—	—	—	*	—
Siam	*	*	*	—	—	—	—	—
Spain	*	—	—	—	—	—	—	—
Sweden	*	—	*	—	—	*	*	—
Switzerland	*	—	—	—	—	—	—	—
Turkey	*	—	—	—	—	—	—	—
United States of America ²	*	*	*	—	—	*	*	—

¹ Russian affairs were in the hands of the German consul at Batavia.

² Panama and Cuba were represented by the American consul at Batavia.

CHAPTER IX

GENERAL ECONOMIC CONSIDERATIONS

Summary of economic products (Plant products—Live-stock—Minerals)—Manufacture—Agrarian and industrial conditions—Land tenure—Agricultural education—Labour and wages—Banking and credit—Currency—Weights and measures—Commerce—Mining regulations.

THE purpose of this chapter is to furnish a review of the most important economic products of Netherlands India, and of agricultural, industrial, and economic conditions generally, leaving details concerning the production and industries of Java and the various divisions of the Outer Possessions individually to the two following chapters.

SUMMARY OF ECONOMIC PRODUCTS

Plant Products

The luxuriant vegetation characteristic of a great majority of the islands of Netherlands India includes a large number of plants, both indigenous and imported, which can be used in the service of man. Hundreds of species of timber and fruit trees and shrubs are found. For example, teak, oak, and chestnut trees give wood for shipbuilding and for the European timber market. The bamboo supplies the native population with the chief material for their simple houses and primitive furniture, while rattans, lianas, and fibrous leaves and plants of many kinds are utilized for weaving, rope-making, and wickerwork. The coco-nut palm is first in importance among food-producing trees by reason of its varied uses and wide distribution. From its sap palm-wine, arrack, vinegar, yeast, and sugar are prepared. Its nut is eaten raw or cooked, and when immature has medicinal properties. The fully ripe kernel yields palm oil. The shell can be fashioned into spoons, cups, and other vessels, the fibres can be made into ropes, mats, or brushes. The young leaf-buds are eaten as a vegetable, and the older leaves are plaited into baskets and used

for thatching. The wood of the stem is hollowed out for water-pipes or aqueducts, and is also employed for rough building purposes, and the dried flesh, or copra, from which oil can be extracted, is in increasing demand as an article of export. Other valuable palms include the areca or pinang, which produces the betel nut, the gebang, which flourishes in West and South Java, and east of the Straits of Lombok, and the sago and sugar-yielding lontar of East Java, Bali, and the dry districts of Timor, Ceram, and Celebes, the leaves of which were formerly used by the natives as writing material. The nipa or dwarf palm grows on the seashore and in low marshy situations. Its leaves are largely used for thatching native buildings. The areng or sugar palm thrives in the plains, on the coast, and in the more temperate regions above the 2,000 ft. level. It yields sugar, arrack, a horsehair-like fibrous substance (*duk*) which is used for cordage, matting, and brushes, and a light spongy tissue (*baruk*) which is valuable for caulking boats, and when dried and mixed with other materials forms good tinder, of which about 70 tons a year are exported from Cheribon to Singapore. The *areng* sugar or Javanese sugar is prepared from the flower stalks and dried by heat. It is chiefly sold on a small scale in the native market, but in some districts of Java it is prepared in large quantities, and about 6,000 metric tons of it have been exported in one year. The leaves of the areng are utilized for the wrappings of cigarettes. An inferior kind of sago is made from the pith. In addition to timber and food-producing trees, santal or sandal wood, ebony, and the camphor tree, with other resinous or gum-yielding trees of economic value, grow wild in various parts of the islands.

The archipelago is remarkable for the number and variety of its edible fruits, seeds, and berries. Many of these appear to be indigenous, and the most characteristic species are too perishable for exportation, and are also often too capricious for introduction into other countries. The mangosteen, durian, pisang or banana, duku, rambutan or 'hairy fruit', tamarind, papaya, papaw, or melon-tree, *nangka wolanda* or sour-sop, and the kindred sweet-sop and custard apple, are all distinctive tropical products. Different kinds of gambu or rose-apple tree (*Eugenia*), melons and pumpkins, guava, pine-apples or ananas and pomegranates grow in profusion, with

oranges, lemons, limes, shaddocks or pompelmosses, and mangoes. The scaly salak, sometimes called the 'forbidden fruit', grows on a prickly palm-bush indigenous to East Java. The Suoo Manila produces a fruit resembling a potato, and wood which is much in request for fine cabinet work. The prolific nangka or jade-tree bears large nutritious fruits which are in great demand among the natives, and also yields the hard yellow jacqueira wood of commerce, which is used in building and in joinery. To the same order belongs the bread-fruit tree, the unripe fruit of which is roasted and eaten as a vegetable by the natives. Wild strawberries, introduced from India, and figs and somewhat small and sour grapes abound. The bonie or wonie, which is like an English currant, the mundu, an orange-coloured fruit resembling an apple, the kechape, which tastes like an inferior peach, the acid blimbing and lobie-lobie, with innumerable other kinds of fruits and nuts, are eaten raw or in jams and pickles by both natives and Europeans.

Rice takes the first place among cultivated cereals, but maize is widely grown, both as a first and second crop, and in some districts, notably in the Timor group of islands, has replaced rice as the staple native food. In the islands of Sawu and Rotti lontar palm sugar forms the chief native means of subsistence, while in the Moluccas sago from the sago-palm is the most important native food. Millet and the oil-producing sesame are cultivated, and wheat is raised in the hills of Java, though with no great success. The natives grow green vegetables, pulse and esculent roots for home consumption, either in the fields as first or second crops, or in the gardens which surround their houses. The leguminous or pod-bearing plants which they call by the generic name of kachang afford highly nutritious food. The green seeds of the kachang iyo, the unripe pods and ripe beans of the kachang kedele, and the young pods and ripe seeds of the kachang tanah, or earth-nut, are eaten as vegetables. The seeds of the kedele are used for 'bean-cheese' or tao-hu, and in the preparation of soya or ketchup, the well-known Chinese sauce. The ground-nut, a valuable secondary crop, is principally cultivated for the sake of its oil. Among plants with edible roots, the natives are particularly fond of the yam and the sweet potato. The ordinary or 'American' potato is also grown in abundance,

and thrives in upland regions, above the 2,000 ft. level. The cassava, from the tuberous roots of which tapioca is derived, grows peculiarly well in Java, and has recently acquired great industrial value in the European market. Arrowroot is prepared in a similar way from the roots of *Maranta arundinacea*, and the bulbs and tubers of several kinds of arum and convolvulus also serve for food. Onions, though apparently not indigenous, are cultivated; cucumbers, a favourite food with the natives, are often planted as a second crop after rice, while in the higher and more temperate regions, cabbages, artichokes, and other European vegetables flourish. Turnips were introduced into Java by the English, and watercress, which grows luxuriantly.

The natives are particularly fond of capsicums or chillies, from which Spanish pepper and Cayenne pepper are prepared. The pungent aromatic leaves of the *Chavica betle*, sirih, or pepper-vine, mixed with areca nuts and other ingredients, furnish the narcotic sirih, which is habitually chewed by the Javanese natives of all classes. The betel or pepper-vine is grown in the lowlands on irrigated land in Java, but the more important spice islands of the archipelago are Sumatra, Borneo, Celebes, and the Moluccas, which produce great quantities of pepper, nutmegs and mace, cinnamon and cloves.

The so-called 'great cultures' of sugar-cane, coffee, tea, cocoa, tobacco, quinine, and rubber, are principally under European direction, and have developed into thriving modern industries, conducted on a large scale. It is estimated that 70 per cent. of the capital invested in rubber is British, though British planters are very few. There has recently been keen competition between British and Americans for control of the rubber export. The cultivation of indigo is now in native hands, and the native oil industry is of importance. Many oil-yielding plants are grown for home and foreign consumption, and the natives also cultivate medicinal and fibrous plants, and use vegetable dyes, extracted by primitive processes, in their textile manufactures.

Live Stock

The Dutch have tried to promote cattle-breeding and veterinary science in Netherlands East India, but even the comparatively enlightened Javanese are still, as a rule, content

with a yoke of a couple of buffaloes or oxen for farm-work, and the fowls and ducks of their poultry-yards, with fish and buffalo-meat for animal food. Horses of different breeds are found in Java, Bali, Lombok, Sumbawa, Sumba, Sawu, Rotti, Timor, Celebes, and Sumatra. Cattle are of great importance in the islands as draught animals and as food ; they are little used for dairy purposes. There are wild cattle in Java, in the forests east of Pasuruan, a district in which the land is ploughed by oxen. But though the ox can be used to plough light upland soils, in the wet rice fields or *sawahs* of the lowlands, where the ploughing is heavy, the strong hardy buffalo or *karbouw* is found indispensable. It is a solidly built animal, living by preference in damp situations, capable of working all day in muddy slush, and protected both from sun and from insects by the caked mud which collects on its hide. It is gentle and amenable to control, and it yields a rich milk which the natives drink. Buffalo flesh is a valuable article of native food, and thousands of animals are killed yearly for meat. Though not indigenous, the buffalo is widely distributed throughout the archipelago, and in some districts herds of practically wild buffaloes are found. Sheep are of little importance ; in the few places where they are found they are mainly used for food. Goats are usually kept in the native villages, and their flesh is also eaten. The Chinese and some of the non-Mohammedan natives eat the flesh of pigs. Wild deer are sometimes fattened for food, and dried venison, horns and deer hide are articles of commerce.

Fisheries, &c.

There are many varieties of fish in the rivers and seas of the archipelago, and fish is an important means of subsistence for the dwellers on the coasts and in the valleys. Whales are caught in the eastern seas, turtles are found on the sea-shore, and the Javanese eat land tortoises and the eggs of the crocodile and of the small alligator, while the Chinese are fond of trepang. In many parts of the archipelago there are pearl fisheries, and a certain amount of mother-of-pearl is exported to Europe and America.

Large numbers of edible birds' nests are exported from Java for Chinese consumption, and there is also an export trade in birdskins.

Minerals

The mineral wealth of Netherlands East India is very great. Sumatra and Borneo in particular are rich in minerals—coal, petroleum, gold, silver, quicksilver, tin-ore, and copper. Borneo produces precious stones, platinum, and antimony. Banka and Billiton and Singkep in the Lingga Islands are famous for their tin. There is gold in Celebes, and also coal, iron, and copper. Gold and copper are found in Timor and Bachian, petroleum in Borneo, Sumatra, Timor, Ceram, Java, and Madura ; manganese, iodide of copper, and coal in Java. Lead exists in Sumatra, with sulphur, naphtha, alum, and saltpetre in the volcanic regions, and also lignite and magnetite. Salt, which is a Government monopoly, is obtained from saline springs, which abound in Java, and from sea-water. In Madura a direct Government manufacture of salt from sea-water is carried on by European methods. In the following chapters it will be shown to what extent this and other mineral wealth has been developed.

MANUFACTURE

Apart from industries connected with such products as sugar and petroleum, organized manufacture is of little importance. Of the thirty million inhabitants of Java and Madura only about 60,000 are so engaged, in upwards of 2,000 workshops or factories. Nearly all of these depend in a greater or less degree on the importation of half-manufactured products. These originally came from Europe, but since the war have been imported from America and Japan. The largest number engaged in any one branch of industry (12,000) is concerned with repairs for all kinds of machinery and railway plant, and only a few less are employed in chemical manufacture and in that of foodstuffs and luxuries. Among the chemical industries is included the native *batik* industry, described below ; in this nearly 8,000, mainly women, are employed. Among foodstuffs the preparation of cassava meal and tapioca in Chinese mills and European factories, where in all over 2,000 natives are employed, is of importance. Other activities belonging to this branch are the baking of bread, the manufacture of butter and margarine, the roasting of coffee, and the manufacture of lemonade, cigarettes, ice, and soap. Two kinds of cattle

food, *bungil*, made from seeds, and 'molascuit', from a by-product of the sugar manufacture, were manufactured for export in 1913 to the extent of 20,000 tons.

The making of hats from bamboo and the leaves of the pandanus or screw pine, is a native industry, carried on largely at home, but developed as a factory industry by French and British enterprise, and is of commercial importance. In respect of the coarser kinds of pandanus, the industry has suffered through competition. But in 1913 over 5,500,000 bamboo hats and nearly 4,125,000 pandanus hats were exported, principally to Europe, the United States, and Australia; in 1915 the figures fell to 3,332,000 and 4,008,000 respectively.

In the Outer Possessions manufacturing activity is much less than in Java and Madura, and is largely concentrated in Sumatra's east coast. The petroleum industry in South and East Borneo employs over 8,000 natives.

Ship-building.—In Java and Madura there are about twenty and in the Outer Possessions four yards for shipbuilding, where motor boats, praus, and native sailing vessels are constructed. Recently iron cargo praus in parts have been imported.

Native shipbuilding of any significance is concerned with the construction of various types of seagoing craft, of which the most important are the *paduwakang*, trading vessels of the Makassarese and Buginese, the *mayang* of the north coast of Java, and the *orembai* of the Molucca islanders, which are principally fishing boats. The industry is carried on chiefly in the residency of Rembang in Java, where it is one of the main occupations of the natives; by the Chinese at Pontianak, and at Negara by natives, both in Borneo, at Jembrana in Bali, in South Celebes at Lemo-Lemo, Bira, Bonthain, Bulu Kumba, and by the natives of Muna Island; at Pambuwang in Middle Celebes (Mandar); at Boano in Ceram, where most of the *orembais* are built; on the island of Palowe to the north of Flores; and at Ruka-Ruka on the west coast of Sumatra. In the eastern part of the colony, the industry flourishes chiefly in the Kei Islands, whence during the favourable monsoon numbers of *praus* are exported for sale in Amboina, Banda, and Ceram.

Native Handicrafts and Trading.—In spite of the import of European manufactured goods, the natives retain a number of handicrafts, and to a great extent provide for their own needs

by home industries and local trading. Much of the trade with the natives and many of the home manufactures are under Chinese or Arab control. Local retail trade is also largely carried on in native markets or *pasars*, and by travelling hawkers or pedlars. The chief native handicrafts are plaiting and weaving, metal-working, building, wood-carving, and pottery-making. References to the ability of various native peoples as craftsmen are made in Chapters VI (on the natives of Java) and VII (on those of the Outer Possessions). Some of the industries have attained a certain celebrity. This is notably the case with the *batik* industry of Java, in which figures are painted in wax on a smooth white cotton ground with a small tool. The stuff is then dyed; the wax-covered patterns remain white, and the wax is melted off with boiling water. This industry has increased, and there are a number of batik factories under the management of Chinese or of half-castes. The best and most characteristic batiks are made in the principalities; west of the Manuk River the industry is only found in Batavia and the environs of Buitenzorg. There is some foreign demand for these products.

AGRARIAN AND INDUSTRIAL CONDITIONS

According to the census of 1905, about five-eighths of the inhabitants of Java and the Outer Possessions who could be reckoned as following a definite calling were engaged in agriculture. The islands of Netherlands India are for the most part naturally fitted for the development of a simple form of agricultural community, practically self-sufficing, and able to subsist with a small amount of labour. On the other hand, their partial and progressive development by the Dutch has introduced and is spreading European industrial organization and ideas, and these and the growth of towns and extension of trade tend to raise the native standard of living. In particular the gradual substitution of money payments for payments in kind has to a great extent revolutionized the system of exchange. While the natives require cash and are more willing than of old to alienate the land which no longer suffices to supply all their wants, a demand for land has arisen among the foreign commercial settlers, and a class of dependent wage-earners, working for capitalist employers, has been evolved.

LAND TENURE

The ultimate ownership of most of the land of Netherlands East India is nominally vested in the State. Part of this land is State-administered as well as State-owned, and constitutes Crown land, State domain or Government land in the narrower sense. In a further considerable proportion of land the natives enjoy possessory rights of usufruct, individual or communal, while in addition it is possible for them to acquire a proprietary title which, under the name of 'agrarian ownership', was created by the Agrarian Law of 1870. A third category is formed by the so-called 'particular lands', which are held by individuals or by companies in full proprietorship as the result of former sales by the Government. In the principalities of Jokyakarta and Surakarta the native princes are still the sovereign lords of the land, and pay their officials with land grants or 'appanages', which carry with them certain fiscal and public rights. There are also native 'official lands', survivals from the days of custom law. An elaborate and extensive system of leasehold tenure has been gradually superposed on these proprietary and possessory rights. Much land is held by a heritable leasehold title (*erfpacht*), which practically ensures security and perpetuity of tenure to the landholder, while much is let on long or short leases of a terminable nature. The leasing of land by natives to Europeans is hedged about with legal restrictions, designed to safeguard the native landed interest.

In 1914 it was officially estimated that the Government held about 83,000 acres of coffee plantations in Java and about 2,000 acres of quinine plantations, while it rented more than two-and-a-half million acres of agricultural land and let about half a million acres to private cultivators. More than two million acres of agricultural land came under the heading of 'particular lands', and about half a million acres were leased to Europeans in the principalities. The total amount of land in Java held from the Government on lease or by heritable leasehold tenure (*erfpacht*) was about a million and a quarter acres, of which more than a million acres were in the hands of joint-stock companies, and the remainder was leased by individual Europeans and Chinese, or by natives. The native Javanese landholders had let some 317,000 acres to Europeans

and Oriental aliens for the cultivation of rice, sugar, and other crops, and for building and other purposes. About two million acres of 'particular lands' were also held by companies and by Europeans. Of these, Chinese held about 300,000 acres, and natives and Oriental aliens about 23,000 acres.

In the Outer Possessions rather more than five million acres were held as hereditary leaseholds (*erfpacht*) or as agricultural concessions from the Dutch Government or from the native self-governing authorities. About 4,000 acres were cultivated under agreements with the native population, and some 12,000 acres were included in the 'particular lands' of Celebes and its dependencies, Benkulen, Menado, and the West Coast of Sumatra.

The State regulation of land in Netherlands East India has a twofold aim: the protection of native rights, and the encouragement of progressive agriculture and industry. Ancient customs are respected as far as is compatible with economic prosperity, while the retention of Government lands under direct State administration and the development of leaseholding give opportunities for scientific experiment and individual initiative. Two main types of agriculture may thus be distinguished in the islands—the native and the European. In the one the land is parcelled out in small shares, generally about $1\frac{3}{4}$ acres to a family, among peasant holders living in village communities and cultivating on a small scale chiefly for home consumption. In the other, large estates of 1,000 acres and more are cultivated under European capitalist direction, by means of paid skilled labour, free or indentured. It has been calculated that land under native cultivation produces on an average, in the most fertile parts of Java, the equivalent of about £7 per acre per annum, but in many districts it is much less. By permitting the natives to let land to foreigners on short leases and leasing waste lands on favourable terms for long periods the Government hopes to save the native from reckless alienation of his land, and to offer an inducement for the cultivation of waste land. Experiments have recently been made in colonizing in the Outer Possessions from the surplus population of the Javanese group of islands.

AGRICULTURAL EDUCATION

The need for agricultural and technical education has been fully recognized by the Netherlands East Indian Dutch since 1905, when a special Department of Agriculture was established. Before this date demonstration fields had been started in connexion with the Buitenzorg Botanical Gardens, but from 1905 onwards local educational organizations were brought into direct touch with the central Government. By 1914, in addition to the Secondary Agricultural School at Buitenzorg and the School of Cultivation at Sukabumi, in the Preanger Regencies, there were eleven primary agricultural schools in Java and Madura, of which two were Government schools, entirely supported by Government, and nine were State-aided private schools, organized and managed by local committees of Europeans and natives. In the principalities the native princes had borne the cost of establishing three schools of this class. In the Outer Possessions two private agricultural schools of primary grade had been started. In these schools the children of native cultivators receive theoretical and practical instruction adapted to their local circumstances and given by trained native agricultural instructors under the supervision of a European chief instructor. Agricultural instruction is also given in the schools attached to Government plantations or private estates, and in some cases municipal or village schools have gardens in which the native pupils work under direction. Agricultural instructors and officials further promote knowledge by meetings and exhibitions. They give practical advice, supply seeds and seedlings, plant demonstration fields, try agricultural experiments, help to check disease in the crops, and generally assist native farmers in matters of trade, credit, and co-operative action. The native agricultural officials are trained at the Buitenzorg Higher Agricultural School and do two years' practical work before they are eligible for a certificate examination. The European instructors are, as a rule, graduates of a Dutch Agricultural University who have passed a further qualifying examination after local experience. Provision is made for agricultural teaching in the ordinary teachers' or training colleges, and Buitenzorg has a native Veterinary School. The whole system centres in the Information Bureau of the Department of Agriculture, under an Inspector of Native

Agricultural Education, and in the celebrated Selection and Seed Garden at Buitenzorg, with its branches in Central and East Java.

LABOUR AND WAGES

In Java a class of free labourers has grown up since the middle of the nineteenth century, in connexion with the establishment of great State-owned or private plantations and factories. Many small Javanese peasant cultivators have thus been forced or tempted to hire themselves out as day-labourers, but many also have resisted the temptation, and, protected from want by their share in the communal fields, have clung to their accustomed way of life. Still more has this been the case with the inhabitants of Madura and the Outer Possessions, where there is much less density of population, and European influence is not so strong. On the other hand, since European labour has tended to be absorbed by the military and civil services, European employers have been thrown back on coloured labour, native or Chinese, and, at least in the Outer Possessions, it has been found necessary, in order to overcome the inertia of the native workman and to obtain security for the employer, to use indentured or contract labour. Such labour has been regulated by the Government of Netherlands East India through the 'Coolie Ordinance' of 1880 and its successors. These ordinances recognize three categories of workmen : (1) contract coolies, who have entered into an agreement under the Coolie Ordinance, involving legal penalties ; (2) labourers with an agreement which does not involve legal penalties, under an Ordinance of 1911, and (3) labourers whose contract does not fall within either of these classes. In every district there is also a class of ' free workmen ' or day labourers, which is constantly recruited from the time-expired foreign coolies, who settle in the land of their adoption. The Coolie Ordinances provide for agricultural, mining, or industrial contracts between employers and labourers who are not natives of the district in which they are to work. The agreements may in no case exceed three years. They contain regulations as to the amount and manner of payment of wages and advances, the kind of work required, re-engagement, holidays, &c. They also lay down the employer's obligations

towards the labourer, including regular payment, free quarters and medical treatment, and the labourers' obligations of regular work and obedience to orders. The contract is registered by Government after the workman has voluntarily accepted the conditions, with a full knowledge of what is implied, and no breach of contract is legally punishable until such registration has been effected. The Government has established a Labour Inspection Bureau on the East Coast of Sumatra, and coolies may bring their grievances before Government officials. The working day stipulated for in a contract may not exceed ten hours.

The wages paid to contract coolies vary considerably in different districts and with different occupations. On rubber estates men usually earn 14 cents Amsterdam currency a day, and women 12 cents with an extra 2 cents a day for men when they renew their contract. Experienced rubber tappers generally receive a monthly bonus of 1 to 1.50 florins, or 40 to 60 cents. On tobacco plantations the average earnings of the coolies who actually plant the tobacco amount to as much as 32 cents a day, while ordinary labourers get 14 to 16 cents. In districts where living is dear contract wages are proportionately high. Mining work is paid at a rate of 16 to 24 cents a day, with food allowances. Advances on wages are commonly granted, but they are legally limited in amount, and the monthly repayments which are deducted from wages may not exceed a quarter of the monthly wage. Contracts usually state that the employer may pay a limited portion of wages in the form of food, but most employers only avail themselves of this permission to supply their workpeople with rice, the staple food, at a fixed price. Mine-owners, however, as a rule provide their men with all the food required. The workers live either in barracks or in separate houses. Labourers whose agreements do not come under the Coolie Ordinance proper are subject to the Ordinance of 1911, which allows contracts to be made verbally, except in the case of labourers recruited in Java, whose contracts have to be drawn up in a prescribed form. Industrial managers in Java and Madura are permitted to recruit labour either in these islands or in the Outer Possessions without a Government licence. For Java they can get all the labour they need at home, but the Javanese are in great request as coolies in the Outer Possessions. Until 1909

this recruitment was unrestricted, but in that year the recruiting of natives in Java and Madura for commercial, industrial, or agricultural work in the Outer Possessions was regulated by a Recruiting Ordinance, which was rendered specially necessary by the sudden extension of agricultural enterprise, particularly on the East Coast of Sumatra, owing to the rubber 'boom' of the years 1909 and 1910. This gave a great impulse to the demand for labour, and led to keen competition in the labour market, where the numbers of recruiting agents working under the Ordinance, and charged with the cost of transporting recruited labour to the Outer Possessions, increased rapidly, while the cost of recruiting more than doubled between 1909 and 1914. Planters also sometimes obtain Government licences to recruit on their own behalf through their general Employers' Associations. The Javanese coolies constantly renew their contracts and remain permanently in the Outer Possessions, either as contract labourers or as free workmen. There is, moreover, a certain amount of inter-insular labour migration within the Outer Possessions. The whole supervision of the relations between employers and employed in the district where the Coolie Ordinances are in force falls to the Department of Labour Inspection and the system of regulated labour is said to work fairly well. Under the operation of these regulations the wages, housing, feeding, and general treatment of the labouring population have notably improved, while the hands of the employers have been strengthened and their authority over their men has been legally recognized. In 1914-15 statistical returns gave 240,751 contract coolies as employed in the Netherlands East Indies, of whom 164,251 were Javanese, men and women, and over 89,000 were Chinese. Of these coolies 187,340 worked on the East Coast of Sumatra, 25,463 in the other districts of Sumatra, including Achin and its dependencies, 1,470 in Amboina and its dependencies, 7,058 in Riouw and its dependencies, 1,795 in Menado, and 17,625 Chinese in Billiton. In Borneo, where the returns date from 1912-13, the number of contract coolies was 8,916. At the end of 1913 there were 163 coolies working under contract in Ternate and its dependencies and at the same date there were 21,379 Chinese contract coolies in Banka and its dependencies.

BANKING AND CREDIT

The Java Bank, founded in 1828, is now a limited liability company, but the Government supervises the management, and without subscribing any of the capital receives a fixed proportion of the profits. In practice, though not legally, the Government has allotted to it the responsibility of regulating the currency, and this it does by controlling shipments of specie. By acting as a 'bankers' bank' it has become the cornerstone of the domestic money market. It is further the mainstay of the financial position of the colony in its external relations, and adjusts the rate of foreign exchange by payments from its gold reserve in Holland and Netherlands India. In this latter task it is assisted by the Netherlands Bank in Holland, which holds its whole gold reserve at the disposal of the colony's foreign credit.

The head office of the bank is at Batavia, and there are agencies at Surabaya, Semarang, Cheribon, Surakarta, Jokya-karta, and Bandung in Java; at Padang, Medan, Bengkalis, Palembang and other places in Sumatra; at Pontianak and Banjarmasin in Borneo; and at Makassar and Menado in Celebes. The choice of positions for branches is jointly decided by the Government and the directorate. At these places the bank carries on ordinary banking business, which includes furnishing capital for large industrial undertakings.

While there are several institutions in Java which carry on a purely banking business there are others which combine the functions of banker and *entrepreneur*. Chief among the latter is the Netherlands Trading Company, founded in 1824, which originally dealt with all the State produce. As regards the sale in Holland of Government produce it still retains this function, for which it receives $1\frac{1}{2}$ per cent. commission. It also engages in industry on its own account, and since 1882 it has developed a large banking business.

The British banks with branches in Netherlands India are the Hong-Kong and Shanghai Banking Company and the Chartered Bank of India, Australia, and China.

For small savings the Post Office has a bank (see p. 428).

While the work of financing agricultural enterprise on a large scale is in the hands of privately owned institutions, the credit system for the native agriculturists and producers and traders

on a small scale, at any rate in Java, is principally maintained under Government supervision.

Previous to Government intervention there were in existence (chiefly in Java) various native friendly societies and kindred institutions. Besides the Prijaji Bank, a friendly society for native Government officials, there were mutual burial and pension clubs, village storehouses for the communal storage of selected rice seed (*lumbung bibit*), and village stores for lending rice to the necessitous (*lumbung miskin* or *lumbung amal*), while in Bali there were village savings banks which advanced money to the villagers. The Government system, inaugurated in 1904, now includes three institutions, the village rice bank (in Java called *lumbung desa* and in Sumatra *lumbung negari*), the money-lending bank, and the divisional banks (*Volksbanken*) of which the Prijaji bank was the prototype.

(1) *Village Rice Banks*.—The capital of these institutions consists of contributions from farmers or, though much less frequently, of the produce of communal lands. Where the inhabitants are not numerous enough to form an initial stock the Government will advance, without charging interest, the money necessary for the purchase of rice and buildings. The rice is lent to needy farmers during the period of field work, and repayment with interest from 25 to 50 per cent. is made out of the ensuing harvest. Any surplus stock is sold and a cash reserve accumulated at the nearest Volksbank.

The management of the bank is in the hands of a committee of villagers, including the village headman, and the books are kept by a paid clerk or *mantri* who visits a group of villages in rotation. The committee receives a share of the profits.

The bank serves the useful purpose of acquiring a quantity of rice from each harvest, with which it subsequently supplements the local food supply. In this way the cornering of the entire harvest by dealers and the consequent rise in the price of foodstuffs are avoided. But recently the improved means of communication and the consequent freer competition has so cheapened rice as to modify the importance of rice banks. Seventy-six of these banks in Java were abolished in 1914, at the end of which year the total for Java and Madura was still as many as 12,206. In the residency of Sumatra West Coast, at the end of 1914, there were 298 banks of this kind.

(2) *Village Money-lending Banks* (*desa, negari* and *marga* banks).—The initial capital of these banks usually consists of a loan from the local Volksbank or the reserve of the rice bank. Small sums, usually not exceeding £1, are lent to villagers at high rates of interest, ranging from 24 to 40 per cent. per annum. Borrowers not only repay principal and interest, which is done by weekly or monthly instalments, but also a further sum which is treated as a deposit. This deposit is in some cases turned into shares of small amount. A borrower must be approved by the general body of the bank's clients. As in the case of the rice banks the work of management is in the hands of a village committee, and it is said to be the Government's object to invest the bank with as much of the co-operative character as possible. This is less easy to accomplish in Java than outside. The Javanese peasant does not yet fully realize the use of money as a medium of exchange, though he is being led to do so by its power to purchase luxuries.

During 1914 the number of *desa* banks in Java and Madura increased by 367, and the total number was 1,670. The total capital amounted to £94,750, of which nearly half was accumulated profit. At the end of 1914 there were 490 banks in the residency of Sumatra West Coast and 30 in the division of Buleleng in Bali.

(3) *People's Banks* (Volksbanken).—These have developed from the savings banks and provident institutions of native officials, and now the sphere of an individual bank covers variously a district, a regency, or, as in the Outer Possessions, a whole province. Their character is that of a savings bank and credit institution, and they are used both by natives and by non-natives. Their initial capital was furnished by the Government at 4 per cent. ; the interest, however, was not paid but used to form a reserve. One or two of the banks are attempting to form a small share capital. The Government has ceased to lend them money, except for special purposes such as the importation of foreign cattle, or to finance the emigration of Javanese to the Outer Possessions. Advances for ordinary purposes are now furnished by the Central Bank.

Deposits in the People's Bank are usually of four kinds : (1) fixed deposits which can be withdrawn at several months' notice ; (2) savings withdrawable without notice ; (3) com-

pulsory deposits bearing an interest of 6 per cent., which are only refunded to clients in cases of absolute necessity ; and (4) current accounts of the village banks. Of the amount lent by the banks the bulk is borrowed by Europeans. European administrative officials preponderate in the management, although native bookkeepers are employed, and clients are being induced to share in the management.

In Java in December 1914 there were 73 People's Banks with a capital of £1,422,660, of which £70,000 had been advanced by the Central Bank.

In the Outer Possessions five new banks were opened during 1914 ; at Banjarmasin in Borneo, Sumatra West Coast (Volksbank Minangabau), at Buleleng in Bali, Sumatra East Coast, and at Langsar in Aceh. There are also banks at Menado in Celebes, and at Palembang and Kuta Raja in Sumatra. A bank of special interest is that at Telok Betong for the use of Javanese colonists in the Lampongs.

Central Bank.—In 1912 a central institution was established at Batavia, the capital of which, furnished by the Government, will be gradually increased to £400,000. Its objects are to furnish capital for people's banks and to assist in their management. It charges 6 per cent. on advances to the banks and a fee for auditing their books. It deals only with well-managed institutions. The staff consists mainly of civil service officials under a director, who is responsible to the Department of Inland Administration. The salaries of these officials are paid not by the Government but by the bank.

In those regions chiefly in the Outer Possessions, where the system of Government credit institutions has not yet penetrated, private moneylenders, generally Chinese, still pursue a thriving trade. Although the rate of interest charged is often exorbitant it is nevertheless true that without the capital supplied by the money-lender, and the stimulus of indebtedness, the natives would cease to produce for foreign markets.

In the towns of the colony there are various friendly societies and private savings banks.

CURRENCY

The currency, like that of the mother-country, is on a gold standard, and the gold coins, which are legal tender to any amount, are the 10-guilder and 5-guilder pieces ; but silver

coins are the usual medium of exchange. Silver coins in the same category are the $2\frac{1}{2}$ -guilder piece (*Ryksdaaler*), the guilder, and the $\frac{1}{2}$ guilder. The $\frac{1}{4}$ guilder and $\frac{1}{10}$ guilder silver coins, besides the 5 cent nickel piece, and the copper $2\frac{1}{2}$ cent, 1 cent, and $\frac{1}{2}$ cent pieces, are legal tender only to a limited extent.

Minting, which is done at Utrecht in Holland, is free as regards gold, but silver coins are only struck in quantities necessary for circulation in Netherlands India. Coins of $2\frac{1}{2}$ guilders, 1 guilder, and $\frac{1}{2}$ guilder are only minted to replace those withdrawn, and in extreme circumstances silver can be melted down to the value of 25 million guilders.

An important branch of the currency is the note issue of the Java Bank, which in October 1914 amounted to £11,600,000. The Java Bank is authorized to issue notes of a value not less than 5 guilders, and its actual issues consist of notes of 5, 10, 25, 50, 100, 200, 300, 500, and 1,000 guilders. While the bank is not restricted in its issue of notes, it is obliged to maintain against notes in circulation and other demand or short-notice liabilities, a reserve of two-fifths in coin and bullion. At least three-fourths of this reserve must be kept in Netherlands India, and at least half must be in the legal tender currency of the colony.

The currency of the Dutch Colonial Government has not even yet completely established itself in all parts of the colony. As a consequence of the close commercial connexion between these districts and Singapore, in northern and eastern Sumatra and West Borneo, the Straits dollar was for some time the standard coin, and in 1906, when its value was fixed at two shillings and fourpence, it gained a stronger influence still. A writer in 1911 states that after 1906 the coolies on the tobacco plantations of Deli and Serdang were paid in Straits dollars. Besides the Straits dollar various other coins like the British trade dollar, the so-called Hong-Kong dollar, the old Spanish dollar, the old and new Mexican dollar, the Japanese silver yen, and the Philippine dollar were in vogue, as were also copper coins from Sarawak, Brunei, North Borneo, Hong-Kong, Kwantung, Mauritius, and other places.

The Dutch authorities could not but regard this state of affairs as derogatory to their prestige, and steps were taken to purge the currency of foreign money. To what precise extent

they have been successful is not clear, but it is stated in an article published in 1912 that the colonial coinage and bank paper are now the sole means with general recognition (throughout the colony) of making payments. Anomalies of a minor kind still exist, however. Copper coins of the time of Van den Bosch existed until recently in Middle Celebes, in the Padang Highlands, and the Lampongs. The silver two-stiver pieces, issued by the old Company, are still in use in Saleier and in South Celebes. In Bali and Lambok there is a widespread circulation of Chinese copper 'cash', or, as they are called in the Residency, *kepengs*. These are circulated in strings of 200 pieces called *ataks*, eight of which go to the rix-dollar which alone of Dutch coins has any vogue in the Residency. While this rate of exchange is common in the bazaars the officials of the opium monopoly demand 1,750 *kepengs* to the rix-dollar, with the result that the natives try to procure—in the bazaars—Dutch money as wherewithal to buy opium.

WEIGHTS AND MEASURES

Besides the metric system there are other weights and measures in common use. There are, besides, many local native weights and measures. Areas are usually given in terms of *bouws* or *bahus*, 1 bouw being approximately equal to 1.75 acre. The *pikol* weight is used in foreign as well as local trade. Originally it varied locally but has been fixed by the Government. It is equal to 61.75 kilograms or 136 lb. The *kati*, first introduced by the Chinese, is now a general trade weight, though used particularly in connexion with opium and precious metals. There are 100 katis to the pikol; 1 kati equals 1 lb. 6 oz. avdp. nearly. The *koyang* is a local weight, used especially for rice. It varies in different parts, being equal in Batavia to 27 pikols, in Semarang to 28 pikols, and in Surabaya to 30 pikols. It thus equals, roughly, from $1\frac{1}{2}$ to $1\frac{4}{5}$ ton.

COMMERCE

Exports

In 1914 the value of the total export from Netherlands India was £57,054,600, of which £3,200,000 was for government account. Of the remainder, goods and specie to the value of

£28,417,300 were exported on private account from Java and Madura, and to the value of £25,434,250 from the Outer Possessions.

The export consists almost entirely of the products of the forests, agriculture, and mining, a few only—like sugar, cassava, and petroleum—receiving treatment before exportation.

The following table serves to indicate the chief commodities and the extent to which they were exported over the years 1912, 1913, and 1914, from Java and Madura and the Outer Possessions respectively.

	1912.		1913.		1914.	
	<i>Java & Madura.</i>	<i>Outer Possessions.</i>	<i>Java & Madura.</i>	<i>Outer Possessions.</i>	<i>Java & Madura.</i>	<i>Outer Possessions.</i>
	£	£	£	£	£	£
Minerals (including petroleum) . .	68,830	4,294,080	94,170	9,354,000	31,330	11,355,830
Ground nuts . .	228,580	34,580	225,330	30,830	202,500	18,420
Cocoa . .	118,580	3,830	141,250	2,000	98,920	1,330
Rubber . .	450,250	1,323,000	740,170	1,245,580	835,830	1,387,750
Cassava products .	651,920	8,580	749,830	8,500	507,080	2,580
Copra . .	1,535,330	2,589,170	1,583,080	3,003,830	1,475,583	3,602,000
Teak . .	200,080	—	196,750	—	195,750	—
Hides .	481,160	131,580	610,410	158,410	285,500	87,250
Kapok .	543,920	62,830	488,410	61,080	436,500	77,330
Cinchona . .	219,170	1,670	362,410	3,250	329,580	5,080
Coffee . . .	1,846,750	547,580	1,261,250	435,660	1,090,500	661,580
Pepper . . .	590,420	545,420	348,080	519,330	437,580	504,830
Rice . . .	588,830	40,250	731,750	11,000	450,580	3,920
Sugar . . .	11,184,410	160	13,050,830	—	15,491,000	—
Tobacco . . .	3,408,130	4,613,170	1,797,580	5,899,160	1,690,500	3,728,750
Tea . . .	1,945,170	—	1,795,330	—	2,234,080	14,070
Fibres . . .	176,080	1,330	293,580	1,083	360,920	1,910

From the above figures it will be observed that Java is responsible for almost the entire export of sugar, tea, and timber, and its exports preponderate generally, but with certain exceptions by which the value of the export trade of the Outer Possessions is made almost to equalize that of Java. These exceptions are: mineral products, copra, rubber, and tobacco.

Netherlands India has been, to a considerable degree, a source from which to supply the mother country with raw materials. Some quantity of nearly every product finds its way to Holland: government tin, practically all the tobacco for the European market, the dry indigo, large quantities of coffee, copra, mace, and nutmegs, maize, black pepper, hides, Java tea, cocoa, and quinine are marketed chiefly in the Netherlands. Great Britain took the greatest quantity of plantation

rubber, almost as much Java tea as Holland, a large quantity of tapioca meal, tapioca flake, dried cassava roots, and, in an exceptional year (1914), a great amount of sugar, also cocoa, nutmegs, and white pepper. Germany was chiefly interested in vegetable oils and took a large quantity of copra, and also the largest quantity of white pepper. The United States of America took most tapioca meal, and considerable quantity of damar and native-grown coffee, also kapok and tea. British India was an important customer for Java sugar (superior white) of which in 1913 it took the largest quantity, also molasses and a large quantity of teak sleepers. China is a large consumer of Java sugar (superior white), sack sugar, and molasses, as is also Japan and, to a lesser degree, Siam. Much of the produce of the native markets of the archipelago went to Singapore and Penang—chiefly sugar, native-grown tobacco, vegetable oils, and a variety of commodities in transit for destinations not stated. Australia took a quantity of maize, sugar, and tea. Other buyers were France, for private tin, timber, and coffee, Austria for private tin and coffee, and Italy for timber and quinine.

The conditions of shipping during the war (cf. Chap. IX, 'Conditions during the war') have diverted from the mother country a large percentage of her colonial trade, perhaps permanently. It is reported (1918) that fears have been expressed by middlemen in Dutch ports that producers of coffee, tea, rubber, tin, &c., in Netherlands India, having established direct trade with America, Great Britain, and other countries, and found it more economical and profitable, will not be willing to resume shipping their produce through Dutch agents in Holland. As a single example, the case of coffee is cited: in 1917 the export of Netherlands Indian coffee from Holland to the United States had ceased, but the direct export of coffee from Netherlands India to the United States was nearly six times greater in 1917 than in 1916.

Imports

In 1914 the value of imports into Netherlands India was about £38,500,000, of which over £2,500,000 were for government account.

The following table shows the chief commodities and the extent to which they were imported into Java and Madura

and the Outer Possessions respectively over the years 1912, 1913, and 1914 :

	1912		1913		1914	
	<i>Java & Madura.</i>	<i>Outer Possessions.</i>	<i>Java & Madura.</i>	<i>Outer Possessions.</i>	<i>Java & Madura.</i>	<i>Outer Possessions.</i>
	£	£	£	£	£	£
Earthenware . . .	277,580	90,416	353,916	124,750	209,083	97,660
Cement . . .	207,660	56,083	250,330	75,500	212,160	54,250
Yarns . . .	320,580	306,660	302,833	365,660	287,660	279,750
Glass & glasswork .	141,750	42,660	151,750	54,830	132,583	13,910
Ironwork . . .	1,671,416	785,083	2,007,410	942,910	1,419,250	753,000
Copper Leaf . . .	40,416	2,830	47,750	4,583	45,166	6,083
Small ware . . .	331,000	122,830	377,910	132,830	299,166	118,500
Matches . . .	213,250	69,910	242,083	62,830	221,416	62,583
Manufactures, cotton goods, &c.	5,645,660	1,753,500	7,168,910	2,163,250	6,596,500	1,738,500
Rice . . .	2,265,750	1,922,583	2,368,830	2,271,080	1,618,083	1,910,000
Coal . . .	324,750	143,916	703,410	168,000	669,083	153,330
Ammonia hydro- sulphide . . .	836,580	250	743,000	1,083	955,830	500

The colony is as far as possible used as a market for the goods of the mother-country, but other countries enjoy a considerable share of the import trade. In normal times, besides Holland, Germany exported considerable quantities of commodities, such as earthenware, iron, hardware, small ware, glass and glass-work, dyes, and even matches, and also machinery and motors. Of the very extensive trade in cottons and woollens, about half was in British hands, the rest coming from the Netherlands. Iron and hardware was also imported from Great Britain. Belgium was an important competitor in the class of goods supplied by Germany, while the great bulk of the matches used in the colony came from Japan. The colony imported coal from various sources, including Holland, Cardiff coal from Great Britain, the United States, and in considerable quantities from Japan, but the main source of supply was Australia, which in 1914 exported about 200,000 tons. A considerable item in the import list is rice, which comes mainly from Saigon, although considerable amounts are regularly imported from Rangoon and Siam. Quantities of dried fish come from Holland, France, and England, while fresh fish and fruit are brought in large quantities from Australia.

The import trade is subject to fluctuations. Money is plentiful at the time of the native New Year, when the native is able to secure advances against the cultures, and purchases of food-stuffs and small domestic articles are freely made. There are also long periods during which the natives' power of purchase

almost disappears. The copra harvest has, in recent years, exercised great influence on the native demand, which is also affected by the state of money circulation.

Trade Organization

Trade, both export and import, is in the hands of a few great institutions and trade houses. These are financed and managed for the most part by Europeans, although in recent years Chinese have built up similar organizations which are chiefly concerned with the export of sugar, and also with the general trade with China. The important function of the Chinese, however, is to act as a middleman between the big trade house and the natives, who, except at Padang, rarely come into direct contact with the European trader. The middlemen, among whom there are also a few Arabs, are by their position enabled to exercise a powerful influence on native production, and their long credit system, which reduces the native producer almost to the condition of slavery, is described as a serious abuse.

While Batavia and Surabaya in Java, together with Singapore, are the chief trade dépôts and ports of shipment for the colony as a whole, the local importance of Makassar, Padang, and Belawan is very great. Makassar is the trade centre for the eastern half of the colony and deals with the export and import trade for Celebes, the Moluccas, New Guinea, and the eastern islands of the Lesser Sunda group. Commodities exported from this centre include coffee, copra, maize, gum copal, rattans, hides, deer-skins, deer-horns, spices, shells, birds-of-paradise skins, tapok sandal wood, and cajeput oil. From Padang are exported the products of western Sumatra, including copra, coffee, tobacco, mace, quinine, cinnamon, and forest products. The port of Belawan taps the rich economic region in the Residency of the East Coast of Sumatra, and exports petroleum, rubber, coffee, copra, and pepper.

Apart from the international exports and imports there is an active local trade between district and district, and between one island and another. This is chiefly concerned with commodities for native domestic consumption, and includes rice, coco-nut oil, coco-nuts, native-grown tobacco, sirih, betel nut, dried fish, building materials for native dwellings, baskets, and native pottery. Singapore is the centre for much of the local trade in an area embracing Sumatra, Java, and West Borneo,

and Makassar serves a similar purpose in the eastern region of the colony. Trade on a smaller scale is carried on between the numerous small ports on the coasts and rivers of the different islands, while in Java among the Malays of western Sumatra and in Bali every small village has its *pasar* or market at intervals of a week or less. Here fish, fruit, and vegetables are the chief commodities bought and sold.

MINING REGULATIONS

In Netherlands India the issue of a licence for prospecting must precede a concession to exploit minerals. Licences for prospecting and concessions are granted to Dutch subjects, inhabitants of, or companies incorporated in, Holland or Netherlands India. Prospecting licences are granted by the Resident within whose jurisdiction the particular area lies, after he has consulted the Director of Government Industries. The licences are granted for three years, and applies to areas not exceeding 10,000 hectares in extent. Before a prospector can obtain a concession he must make good his claim before the expiry of the prospecting licence. Concessions are granted generally for a period of seventy-five years, and as regards the exploitations of a bituminous material, for an area not exceeding 2,000 hectares in Java and Madura and in Sumatra West Coast, and 4,000 hectares elsewhere ; as regards other minerals 1,000 hectares is the maximum area for which concessions are granted. Holders of prospecting licences pay a tax at fixed rate per hectare, and a royalty of 40 per cent. on production over the value of about £420. Concession holders also pay a tax : ten times as much per hectare and 4 per cent. on the gross product.

There are in the colony certain areas on which private mining is forbidden, and others reserved for the Government's prospectors.

CHAPTER X

ECONOMIC PRODUCTS OF JAVA

Agriculture (Agricultural methods—Rice—Secondary crops—Sugar—Coffee—Tea—Cocoa—Tobacco—Indigo—Coca—Fibres—Vegetable oils—Spices)—Forestry, forest products, &c. (Forestry administration—Teak—Coconut-palms—Fruit culture—Rubber—Cinchona—Rattan)—Live-stock—Petroleum and other mineral products.

AGRICULTURE

Agricultural Methods

THE most important department of native agriculture in Java is the cultivation of rice, the staple food of the population. Maize and other cereals and vegetables, pulse and edible roots are commonly grown, and often supply secondary and subsidiary crops, supplementing the rice harvest, or providing substitutes when the rice crop is inadequate. Native agricultural implements are simple, though they compare not unfavourably with those of other primitive peoples. The plough for irrigated land, generally of teak wood, with a yoke of bamboo, and the point tipped with iron, is drawn by two buffaloes. A still simpler plough is used for dry and mountain cultivation. For gardens and the little fields adjoining villages the small Chinese plough with one buffalo is often employed. A harrow, the *pachul* or hoe, the *arit*, a weeding knife or small hatchet, the *ani-ani*, the characteristic knife used to reap the rice ears, and perhaps a roller and a dibble, complete the native's equipment, and he is unwilling and slow to accustom himself to European tools and machinery.

Irrigation.—The provision, distribution, and drainage of the water needed for agricultural purposes is specially important in Java, where the rainfall is unequally distributed both in place and time, while the most extensive rice-fields and the densest population are found in those low-lying regions where artificial drainage and irrigation are essential. The amount of water required may be gathered from the estimate that for the yearly irrigation of one *bouw* (about 1·75 acres), an average

of a litre of water per second is needed for a period of about 120 days.

The sources available for irrigation are reservoirs of rain or river water, lakes, wells, springs, and rivers. Reservoirs are most frequently found in East Java, where they are used to supplement the rainfall in times of drought. The natives make simple ponds or reservoirs called *waduks*, which play a considerable part in the irrigation of the Solo valley. This kind of irrigation is crude and wasteful, as the *waduks* take up a space disproportionate to the supply of water stored.

More practical, and much more widely used, is the system of canalization from running streams. The natives early practised primitive methods of raising water by a scoop or water-wheel. They also developed a system of irrigation by terracing and canalization, on which the *sawah* or wet cultivation of rice depends. The natives show considerable ingenuity in constructing dams, and carry water across ravines in aqueducts of hollowed coco-nut trunks supported on bamboo posts. In 1912 it was estimated that nearly three million acres (1,700,000 *bouws*) of land in Java were irrigated by native waterworks. But the dams are often swept away by floods, and the general expenditure of time and labour are disproportionate to the results. The older native system, moreover, neglected the equal distribution of the water and the drainage of the irrigated fields, while the regulation and control of the water-supply was inadequate.

It is only since the last decade of the nineteenth century that the Dutch have elaborated a scientific irrigation system in Java, which has supplanted, adapted, or supplemented native methods. The Oosterslokker and the Westerslokker canals, which were constructed in the neighbourhood of Buitenzorg in the eighteenth century, were primarily intended for navigation, though they were applied to the purposes of irrigation. In the nineteenth century an impulse was given to the formation of a national system of irrigation by the introduction of the culture system. The most famous waterworks which were constructed as a result of the introduction of the culture system were at Sampean, Brantas, Cheribon, and in particular at Demak, in the residency of Semarang. In 1885 the so-called Irrigation Brigade, a special section of the Corps of Engineers, was entrusted with the preparation and

execution of irrigation works, and the irrigation service was kept as far as possible distinct from the other functions of the Department of Waterways. Further reforms were rendered necessary by the decline in the irrigated area, which fell in twenty years from nearly two and a half million acres to about one and a half million acres, in spite of an increase of 300,000 in the population. In 1889, in accordance with the suggestions of a commission appointed two years previously, the first irrigation division (*irrigatie afdeeling*) was started in connexion with the Serayu, the most important river of the southern coast.

Following this experiment a general irrigation scheme was brought forward, and by 1912 Java had seven irrigation divisions, six in full working order, and one, Madiun, working in part. The divisions were Serayu, Brantas, Serang, Pekalen-Sampean, Pekali-Tyomal, Madiun, and Manuk. These fall within the larger administrative divisions of the Department of Waterways. The irrigation divisions are entrusted with the management of rivers and open waters, irrigation, drainage, and the control of all works which serve for the supply and discharge of water, or for inland navigation. The work, in so far as it does not come under the General Civil Service, is carried out by the local authorities, by the people, or by various public bodies, and, exceptionally, by private individuals. The head of the irrigation division is an engineer of the Department of Waterways, but he and his staff are under the general authority of the local resident, and in specially important cases the head of the division of the Department of Waterways is consulted. Of late years there has been a reaction against the tendency to over-centralization in European hands which was perceptible in the irrigation administration after 1885. Up to that year the distribution of the water from the irrigation works had been left to the native officials and population, with such unsatisfactory results that the extremely detailed distributive schemes which were introduced after 1885 deprived the people of all initiative. Experience has shown, however, that with small areas of about 150 to 250 bouws (250 to 440 acres) the natives are competent to carry out the direct distribution and management of the water for themselves.

According to official statistics for 1914 there were in Java and Madura, exclusive of the principalities, 5,480,707 bouws of irrigated and dry rice-fields under native cultivation, on

which rice was grown for home consumption. Of these, 2,231,141 bouws were *sawahs* watered by rivers and streams, 1,047,652 bouws were *sawahs* entirely dependent on rain, 78,379 bouws were marsh *sawahs*, and 2,123,535 bouws were *tegal* or unirrigated fields. This meant an increase from the previous year, 1913, of 160,306 bouws : 9,573 bouws of river-fed *sawahs*, 19,453 bouws of rain-fed *sawahs*, 10,496 bouws of marsh *sawahs*, and 120,844 bouws of *tegal* fields. The total extent of land under native rice culture in Java and Madura irrigated and unirrigated, amounted in 1900 to 4,041,735 bouws, in 1905 to 4,111,875 bouws, and in 1910 to 4,700,907 bouws.¹

In 1913 a sum of nearly two and a half million florins was expended on the prosecution of seventeen great irrigation and drainage works, in addition to considerable expenditure on smaller works, repairs, and measures of economic development. Forty-eight million florins had been spent on irrigation works by 1912, and by 1910 scientific irrigation works for flooding areas exceeding 10,000 bouws had been constructed, or were in course of construction, in the residencies of Bantam, Batavia, Cheribon, Pekalongan, Semarang, Surabaya, Madiun, Kediri, and Besuki, while extensive works in Pasuruan are in progress. The rivers utilized are the Ujung, Liwung, Sedani, Angkee, Manuk, Sangarung, Jengkellok, Pemali, Gung, Rambut, Waluh, Tyomal, Serang and Tuntang, Bodri, Surabaya, Brantas, Madiun, Sampean, and Bedadung.

The modern irrigation works in Java are often fine pieces of engineering. The main Pamali canal, which irrigates about 35,000 bouws, claims the largest aqueduct in the world. The

¹ For greater ease of reference these figures may be given to the nearest hundred acres, thus :

		<i>Acres</i>	
Native rice-culture for home consumption, 1915		.	9,591,300
including—			
		<i>Acres, 1914</i>	<i>Increase over 1913</i>
River <i>sawahs</i>	.	3,904,500	16,600
Rain <i>sawahs</i>	.	1,833,400	34,000
Marsh <i>sawahs</i>	.	137,200	18,400
<i>Tegal</i> fields (unirrigated)	.	3,716,200	211,500
		Total increase	280,500
Native rice culture, 1900	.	7,073,000	acres
„ „ 1905	.	7,195,800	„
„ „ 1910	.	8,226,600	„

prises d'eau, or canal heads, are well designed and constructed, and there are elaborate arrangements of secondary and tertiary canals, aqueducts, syphons, dams, and sluices.

There is some difference of opinion as to the wisdom of these large schemes from the financial point of view, but their influence on agricultural production is generally allowed to be good. The area of irrigated rice-fields has increased steadily if slowly during the twentieth century, and the total rice production has risen, on an average, about two million pikols a year since 1905. The average yield of rice per bouw on wet rice-fields is about double that on dry fields, and about a third in excess of the yield on fields entirely dependent on rain.

The improvements in methods of irrigation under the modern system are great. One of the most ingenious plans for the fair and economical distribution of water is the *golongan* or 'group' system. The fields of all the *desas* concerned are divided into six roughly equal portions. The fields of A, the first *golongan* or portion of all the *desas*, receive water at the beginning of the wet monsoon, November 1, and must be fully planted by December 1, using up thus one-sixth of the total water capacity. The second group of fields, *golongan* B, is watered on November 15, and has to be planted by December 15. The four subsequent groups are watered on December 1, December 16, January 1, and January 16 respectively. By January 16, then, all the available flood-water will be in use. The season during which the crops have to stand in water lasts from $3\frac{1}{2}$ to 5 months. Thus *golongan* A can be drained by about March 6, *golongan* B by April 15, and the sixth and last *golongan*, F, by June 1. The result is that the whole provision of water is only in use for a couple of months, from January 16, when the flooding ends, to March 16, when the drainage begins, and that the demand for the river water, small at the beginning of the wet monsoon, when the supply is also small, increases proportionately to the increase of supply in the course of the monsoon, and decreases in the same way with the decrease of supply towards the close of the wet season.

The intimate local knowledge and interests of native authorities make it advisable to entrust the smaller details of local irrigation to them, and the fact that irrigation invites co-operative action, has probably tended to strengthen and perpetuate the communal organization of the *desas*. The work

of irrigation may be performed by a village group acting conjointly and sharing the cost, or as a compulsory service rendered to an individual overlord, or to the State. The compulsory labour system which has been used in the past for the maintenance and repair of irrigation and drainage works is to be replaced in the future in the Government service by free paid labour. In some districts the priest was formerly the regulator of the water-supply. The Dutch Government has abolished this practice, but a special irrigation official is sometimes added to the local administrative body. In other cases the work falls to the village headman.

Rice

The name Java (*Jawa-dwîpa*) is now usually accepted as meaning 'rice-island', and it is probable that rice was grown by the native Javanese from very early times, before the coming of the Hindus. In 1911 it was calculated that 5,438,000 of the 7,460,000 acres then cultivated by the natives in Java and Madura were under rice. Although rice yields best on low moist ground, it can be cultivated on high land and under comparatively dry conditions. Hence the distinction which is made between the two chief forms of rice cultivation, the *gaga*, *ladang*, *humah*, *tegal* or dry system, and the *sawah*, or wet system. Mountain rice is generally used in dry cultivation, as it requires less water than other kinds, and thrives on comparatively dry soil and often at high latitudes. Dry cultivation, the simplest and probably the oldest form of rice culture, was formerly common in Java, but it has been discouraged by Government, and in 1874 the natives were forbidden to take waste land into dry cultivation without express permission. Since 1900, however, there has been a noticeable and steady increase in the area under dry cultivation. In 1914 the total area of all dry or *tegal* rice-fields in Java and Madura was 3,716,300 acres, as against 5,875,000 acres of wet or *sawah* fields of different kinds. Dry cultivation also persists to the exclusion of all other methods of agriculture among the conservative and isolated Baduj of the Bantam residency.

The chief drawbacks to dry rice cultivation are the rapid exhaustion of the soil, the reckless felling of timber to bring fresh land under the plough, and the restriction of cultivation by its dependence on rainfall and on physical and climatic

conditions. Thus it is neither so convenient nor so profitable as wet or *sawah* cultivation, which is so closely identified with agriculture generally that the same word, *tani*, is used in Javanese and Sundanese for both.

Sawahs, or wet rice-fields, are commonly divided into three classes : (1) fields fed by running water ; (2) fields dependent for their water-supply on rain alone ; (3) marsh *sawahs* dependent on stagnant water, or on 'ground-water'. *Sawahs* are level fields, divided into compartments by low dykes, which enable them to be flooded and drained at will. Such fields are found both in the plains and on hill-slopes to a height of about 3,500 ft. As a rule they are arranged in embanked terraces, for purposes of irrigation, in order that the water may be banked up in the field or allowed to flow through sluices from one terrace to another. Marsh *sawahs* have a constant supply of water, but little can be grown on them except rice, and they are few and unimportant as compared even with rain-fed *sawahs*, while these extend over less than half the area covered by river-fed *sawahs*, which are relatively independent of rainfall.

The sowing usually takes place in October, at the beginning of the rainy season, and harvest is reaped from three and a half to six months after the transplanting of the young plants. These are laid ready for planting on the saturated field by men, while women usually do the planting. The harvest is reaped by women. The reapers are paid by a share in the harvest, varying from one-tenth to one-fifth, and the harvest season, followed by the time when the rice is stamped or pounded, is a period of rejoicing, when feasts are held and marriages are celebrated. After the rice has been stacked and dried it is threshed either by treading with the feet or by stamping in a hollow wooden mortar with a long wooden pole. It is then peeled or hulled in a second mortar, and the grain is finally separated from the bran by winnowing. The bran is used for fodder and the straw can be utilized in the hat manufacture. Women and girls are employed for stamping and pounding, but in some parts of Java rice is peeled or husked in mills driven by water-power or by buffaloes. These mills, however, are mainly used to prepare rice for the European market. It is said that four-fifths of the total number of rice-mills in Java are in the hands of Chinese proprietors.

The traditional character of native rice cultivation, its historic and religious associations, and the way in which it is interwoven with village life, have made it difficult for Europeans to introduce modern methods of culture in Java and Madura. But the native population increases rapidly and at the same time the European demand for Java rice is considerable. Between 1885 and 1900 the superficial area under rice cultivation had only increased 16 per cent., while the population had increased 30 per cent. The import of rice into Java largely exceeds its export, and though this is partly due to the exportation of the better qualities and their replacement by inferior foreign grain, this does not fully explain the preponderance of imported rice in a country which at the end of the eighteenth century was the rice-granary of the Malay Archipelago, with an important export trade among the neighbouring islands. The Government is thus faced with the difficult problem of stimulating and improving the native rice culture in Java without discouraging the foreign rice trade. The Department of Agriculture, Industry, and Commerce has issued reports on the rice crop and the Eastern Asiatic rice market, and official educational pamphlets have been published. Inquiries into the diseases of the rice plant have been instituted at Buitenzorg, and a special section of the Department of Agriculture is occupied with selecting, importing, and distributing rice seed and plants for native cultivation. Attempts have also been made to obtain new species by cross-fertilization, and in this way large-grained varieties for export have been produced, and the output of some of the native varieties has been increased. Dry nursery-beds for the seedling rice-plants have been introduced into some of the native estates in the Cheribon Residency, after experiments had shown their superiority over the traditional wet seed-beds, and modern ploughs are in use among the native farmers in the Pasuruan district.

The communal functions of the *desa* or village community extend to matters affecting rice-cultivation. There are common seed-beds, and many village rice-sheds have been started, to lend seed-rice to cultivators, and to buy common stores of rice when prices are low. Several villages are generally grouped together for these purposes under a native local official (*mantri*).

The average annual produce of *sawah* rice for Java, Madura,

and the Principalities is estimated at about 25 pikols per bouw, or about 1,943 lb. avoirdupois per acre, allowing 136 lb. avoirdupois to the pikol and 1.75 acres to the bouw, and ranging from about 2,798 lb. per acre in Kediri to about 1,321 lbs. per acre in Madura. Dry rice-cultivation has about half this annual yield, 12 $\frac{3}{4}$ pikols per bouw. The general average of production per bouw during the years 1905 to 1915 was remarkably steady. In 1914 the approximate production of rice in the whole of Java and Madura exclusive of the Principalities was 93,114,970 pikols (about 5,529,000 tons), an increase of between eight and nine million pikols since 1910. Returns for 1915 show that in that year the heaviest wet rice crops were reaped in East Java, while the greatest extent of land from which wet rice crops were successfully gathered in was found in Central Java, and the widest area of successfully harvested *tegal* or dry rice-fields in West Java. Of all the residencies the Preanger Regencies produced the greatest amount of *sawah* rice.

The Chinese are the chief middlemen between the native producer and the European merchant, but the greater part of the Java rice which is exported to Europe is grown on private estates in the residencies of Cheribon and Batavia. The best quality, which commands a high price in the European market, comes from the great private estates of Indramayu West and Kandanghauer, in Cheribon. Java rice ranks first among the different kinds imported into the Netherlands from India, Indo-China, Japan, or Persia. The export of peeled rice from Java and Madura amounted, in round figures, to 62,000 metric tons in 1913, 38,000 tons in 1914, and 33,000 tons in 1915. The chief countries which bought these consignments were the Netherlands, France, Austria, and Australia. The export to Australia, which had risen from 11 tons in 1910 to 1,178 tons in 1913, dropped to 335 tons in 1915. The export of unpeeled rice, always inconsiderable, fell to nothing in 1915.

The importation of foreign-grown rice into Java from British India, Saigon, Siam, and Singapore was about 258,416 metric tons in 1913, 215,743 tons in 1914 and 334,455 tons in 1915, a rise which led to the exaction of guarantees by the British Government that the rice was for home consumption and not for re-exportation.

Secondary Crops

The fertility of the soil of Java makes it possible to grow more than one crop in a season in the same field. Where there is abundance of water this second crop may be rice, but frequently the rice-fields lie fallow for awhile after the harvest, and are used as pasture for cattle till they are planted with a second crop of a different kind. Among these secondary crops, which alternate with rice, and are called by the natives *palawija*, are included maize, millet, tapioca, or cassava, ground-nuts, sweet potatoes, soya beans, sesame, and green peas.

Maize.—Maize (*jagung*) is grown as a subsidiary food-crop round native dwellings, as a first or second crop on dry (*tegal*) fields, and as a second crop on *sawah* fields after the rice harvest. In East Java and Madura, where it is very generally cultivated on dry rice-fields, it is either planted a few months before the rice, or between the rows of young rice. It ripens in two and a half to four months. In some parts of Java and Madura, particularly in mountainous districts, it has practically replaced rice as the staple native food. Elsewhere it is regarded as a substitute if the rice harvest fails, but in seasons of plenty its use as human food is a sign of poverty, and it serves chiefly to feed horses and poultry. It has become an important article of home consumption and of export. In 1913 about 40,000 metric tons of peeled maize were exported, and more than 57,000 tons in 1914. In 1915 maize was harvested from about $3\frac{1}{2}$ million acres. The maize-fields lie chiefly in East Java, but Central Java also contains a large number. The largest area planted with maize was in the residency of Pasuruan, the smallest in the residency of Batavia.

Millet.—The Javanese call the large-grained millet 'maize rice' (*jagung pari*). Millet is grown everywhere as a subsidiary food-crop. It is sometimes planted between the rows of rice on the *sawahs*, and, like maize, it is prolific and useful, and is extensively cultivated by the native population.

Cassava.—The cassava plant, from the roots of which tapioca is made, grows well, and since the beginning of the twentieth century its cultivation has spread widely, and the preparation of tapioca for the European market has become an important industry. The natives boil, bake, or dry the

roots, and prepare them for food in various ways. Cassava will grow where there is a poor water-supply, where the rice crop has failed, on dry fields, or on native farms. It is rather a supplementary crop, or a catch-crop, than a secondary crop in the sense of alternating with rice on the regular wet or dry rice-fields. The cultivation and preparation of cassava for the market, once practically limited to West Java, has spread over Central and East Java, and, particularly in the Preanger Regencies and in Kediri, has assumed considerable industrial importance. The number of factories engaged in preparing tapioca flour and other products of the cassava plant constantly increases, and in Kediri and elsewhere former coffee plantations are now used for cassava cultivation. Nearly all the cassava products exported from the Netherlands are prepared in Java. The natives make cassava flour in great quantities in a primitive way. It is called *kampong* or village flour, to distinguish it from the factory flour made usually under European control. In 1914 about 600,500 acres in Java and Madura were under native cassava cultivation, ranging from about 282,000 acres in Central Java to between 47,000 and 48,000 acres in Madura. Many native villages, especially in the Preanger Regencies and in parts of East Java, are occupied almost entirely in the preparation of cassava or tapioca flour, which is an article of export, but fetches much lower prices than factory flour. The native flour-makers sometimes sell the undried product to Chinese millers, who wash, sift, and dry it. The flour is shipped chiefly to Great Britain, the United States, France, and Holland. The waste from the manufacture, or *ampas*, is collected and dried, and is exported to Europe for use as cattle fodder or in distilleries. Dried cassava roots, or *gaplek*, are also exported for cattle fodder and to be used in distilling cheap alcohol. The value of tapioca as an economic product is attracting attention in Java, and attempts to produce new varieties of the cassava plant have been made at the Buitenzorg Experimental Station for rice and secondary crops. In 1914 there were ten large European tapioca factories in Java, of which three were in the residency of Kediri. The total area planted with cassava in Java and Madura in 1915 amounted to about 682,000 acres, and cassava was harvested from about 987,000 acres. The largest area under cassava was in Central Java, the smallest in West Java. The exports of tapioca meal for

the years 1913, 1914, and 1915 were about 53,200 metric tons in 1913, 48,500 tons in 1914, and 43,800 tons in 1915. The chief buyers were the United States, England, Singapore, and the Netherlands. In the same three years the exports of tapioca flake and pearl, dried cassava roots (*gaplek*), and tapioca waste (*ampas*), were approximately as follows: 1913, flake, 10,400 tons; pearl, 778 tons; gaplek, 25,941 tons; ampas, 14,159 tons; 1914, flake, 8,200 tons; pearl, 1,324 tons; gaplek, 37,249 tons; ampas, 6,541 tons; 1915, flake, 5,500 tons; pearl, 459 tons; gaplek, 31,456 tons; ampas, 2,612 tons. The chief buyers were England, a purchaser of large quantities of tapioca products, the United States, and the Netherlands. France was also a purchaser of flake tapico. In 1915 prices rose at first owing to a demand from the Netherlands and Germany, and though they dropped when tapioca products were declared contraband, only the exports of *ampas* and of pearl tapioca were seriously affected.

Sugar

The sugar industry is not in native hands. The independent European manufacturer is, as a rule, the planter of the raw material and the master of day labourers. This development was probably rendered inevitable by the sugar crisis of 1884 and the epidemic of *sereh* disease which broke out in 1883. The fortunes of the growing industry were jeopardized, and only European direction and capital could prevent disaster. Since 1892 the average production per acre has greatly increased and improvements have been made in sugar culture and manufacture, and the development of the industry has been due in the main to the efforts of the planters themselves, though the central authorities have shown concern for the progress of the sugar trade.

The sugar estates of Java lie almost exclusively in the centre and east. Though a few small plantations are found west of the Manuk, that river may be taken as the western boundary of the sugar area, which stretches in a belt reaching from the sea to the foot of the hills along the northern shore from the Manuk to the mountains of Rembang, and will extend still further in the same direction when all the prospective schemes for new estates have been carried out. In the corresponding plain south of the central mountain range many sugar planta-

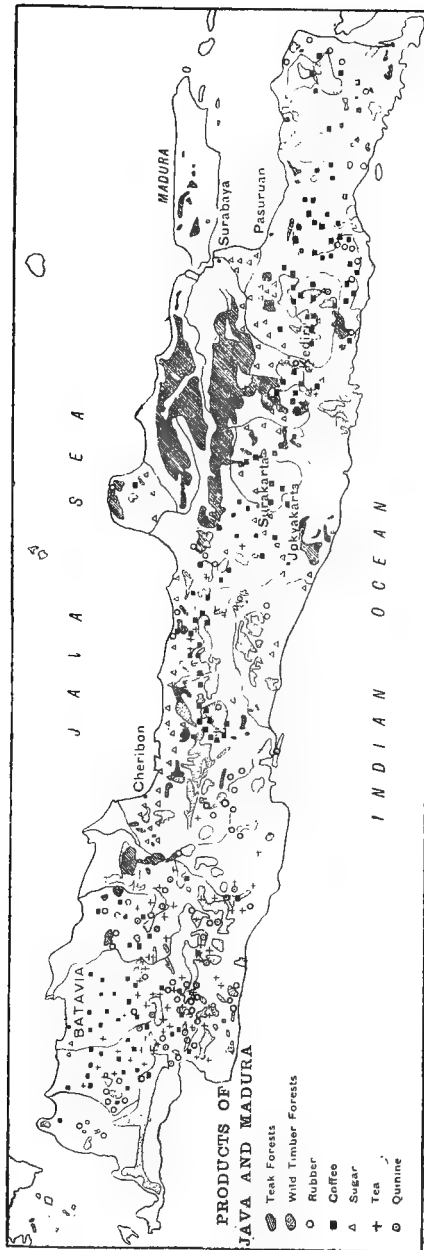


FIG. 2. Distribution of certain economic plants in Java

tions are also found. In East Java sugar is chiefly cultivated in the valley of the river Brantas, on the plateaux between the volcanoes of Madiun and Kediri, in the wide alluvial lowland on the north shore of the eastern part of the island, and on the coast facing Bali Strait. The highest number of factories and the largest acreage under sugar cultivation are in the Surabaya residency, the fewest factories and the smallest acreage planted with sugar-cane are in the residency of Kedu. The ancient sugar works in Batavia and Krawang no longer flourish. The distribution of the sugar-growing lands, though partly due to the soil, is mainly determined by climate. Abundant rainfall during growth and a dry harvest season best suit the cane, and these are found in East and Central Java rather than in the western districts.

According to an estimate in 1914 there were 184 sugar factories working in Java in 1912, nearly 347,000 acres were planted with cane, and the total annual production amounted to more than a million tons *avoirdupois*. The total area under cane cultivation was considerably larger, as the cane crop takes more than a year to mature, and fresh fields are planted simultaneously with the harvesting of the preceding year's crop.

The natives grow sugar-cane on both dry fields and *sawahs*, but the great manufacturers cultivate almost entirely on irrigated land. The right of using the local irrigation works is included in the rent of the estate. On private estates held in perpetuity and in the principalities the planters have a practically free hand in the disposal of irrigation-water. As the chief cane-fields are situated in populous districts, there is not much difficulty in obtaining temporary free labour for cane cultivation. The heavy labour is performed by men. Women cut the cane crops, weed, and water, while children destroy insects and do other easy work. When the rice harvest is cut the land is prepared for cane. Of the many diseases to which sugar-cane is subject the most formidable are the infectious *sereh*, a disease of the vascular tissues, to which the extensively cultivated Cheribon cane is peculiarly susceptible, and the *dongkellan*, a rot which attacks the roots.

There are still many small factories in Java, generally in native or Chinese hands, in which sugar or syrup is prepared for domestic use by primitive methods. The more complicated

modern system has developed from these early methods, which were introduced by the Chinese, and at the present time Java is distinguished among sugar-producing countries for the excellence of its factory equipment. The sugar season generally lasts from May to September, so that both planting and manufacture fall within the east monsoon, or dry season. Experimental stations have been established at Semarang in Central Java, Kagok in West Java, and Pasuruan in East Java. There is a general syndicate of sugar manufacturers, which acts as an advisory committee to the Government.

Before 1874 Java sugar was almost exclusively shipped to Holland. After the abolition of preferential duties in that year, and with the growth of the Dutch beet-sugar industry in Europe, the export sugar-trade was to a great extent diverted to England, while the by-products were largely bought by China and the East. A considerable amount of Java sugar also went direct to Singapore. After 1890 America became an important purchaser of Java sugar, though the trade declined somewhat when the Spanish-American war gave the United States sugar-growing colonies, and also stimulated the American beet-sugar industry. Meantime there was a steady and increasing demand from Japan and Hongkong for raw sugar to be used in the refineries there. Hongkong imported the raw material from Java and exported the refined product to British India. The Java manufacturers were deterred from trying to capture this trade by the risk of establishing refineries on a large scale in a country like Java, which exports some 90 per cent. of its produce, and is dependent on the varying fiscal regulations of external Powers. White sugar, however, which could be consumed without further refining, was regularly manufactured for export from 1903, and became popular in British India. The export to British India rose in the ten years between 1905-6 and 1915-16 from about 116,000 to about 381,000 metric tons. In 1910-11, when there was a failure in the European beet-sugar crop, and the import of white sugar from Europe and Hong-Kong almost stopped, it stood as high as 530,000 tons. In years of bad home production Australia has also turned to Java for much of her sugar-supply. The total exports of sugar from Java and Madura amounted in 1905 to 1,049,871 metric tons, in 1910 to 1,316,946 tons, and in 1915 to 1,967,277 tons. While in 1913 Java exported

about 300 tons of sugar to England and over 700,000 tons, including molasses, to British India, in 1914 more than 600,000 tons went to England as against about 450,000 tons to British India, and in 1915 the export to England exceeded 217,000 tons, and the export to British India was about 550,000 tons.

The Java sugar industry holds, therefore, an important position in the world-market. Java stands second to Cuba as a cane-sugar producing country. In 1914 there were about 186 factories in working order, employing on an average 500 to 600 workers, male and female, per factory, in addition to field labourers.

Palm Sugar.—The native manufacture of sugar from the areng palm, though not of great economic importance, deserves notice. Tapping the areng palm for saccharine juice is almost an hereditary occupation in parts of Java, where the natives, by long experience, have acquired great skill and knowledge. The sugar is packed in palm-leaves and sold in the native market.

Coffee

The cultivation of the coffee plant was introduced into Java at the end of the seventeenth century. It was a Government monopoly under the culture system, and though this monopoly has been abolished in Bantam, Krawang, Japara, and Rembang, there are still extensive districts in the Preanger Regencies and the residencies of Pekalongan, Pasuruan, Besuki, Madiun, and Semarang, as well as in Kedu, Kediri, Surabaya, and Banyumas, in which it persists. In 1914 there were about 83,000 acres in Java under Government coffee cultivation. The Government estates show steadily decreasing revenues, and the future development of the coffee industry will probably depend chiefly on private European planters. *Coffea Arabica*, or Java coffee, the kind almost exclusively cultivated in Java till 1875, will grow at any height up to 4,000 ft. above sea-level, but thrives best at an altitude of from 1,500 to 3,000 ft. *Coffea Liberica*, which was introduced from West Africa in 1875, flourishes on low ground, from sea-level to about 1,500 ft. On forest land the ground is cleared for coffee either by cutting down all the trees except a few which are left as a wind-screen, or by leaving the trees intact, rooting up all shrubs, and planting the coffee beneath the shade of the forest. The coffee-

tree begins to bear after two or three years, but does not yield abundant crops for five or six years. The fifteenth year is the usual limit of productivity. In high altitudes the fruit sometimes takes seven to twelve months to ripen, but it matures more quickly on lower levels. There are usually three crops a year, the 'previous', 'big', and 'after' crops, which follow in rapid succession. The coffee plant is subject to a destructive leaf-blight, and to the depredations of the 'coffee-louse', the 'coffee-borer' or weevil, and the *leewak*, or palm-marten.

The natives simply pound their coffee with heavy poles in troughs, but the European factories are generally fitted with modern appliances. There are two methods of preparing the beans, the local or 'ordinary' method and the West Indian, Brazilian, or 'wet' method, which is now almost universally adopted. By the first method the berries are dried in the sun or by artificial heat, and the husks are removed by coffee pulpers or 'hullers' worked by water or steam. About 700 lb. of freshly picked berries will yield 136 lb. of prepared coffee. By the second method the berries are pulped immediately after picking, deprived of their fleshy pulp by washing, dried, moulded or stamped, and fanned to get rid of the husk.

Up to 1875 *Arabica* coffee was almost the only variety cultivated in Java, but other kinds have been introduced since that date, notably *Liberia* coffee and *Robusta* coffee. In many districts *Liberia* has superseded *Arabica*. *Robusta*, an African coffee, is often preferred to *Liberia*, as better suited to the Javanese climate and peculiarly fitted to resist disease. A new variety of coffee, *Quiloa*, has been tried in Java, and promises well. The cultivation of coffee-hybrids has not been very successful.

Java ranks third among countries producing coffee for the world-market. In 1915-16 the island produced about 550,000 bales. Though it seems probable that, considering the dense and growing population of Java, the area available for coffee cultivation cannot well be extended, on the whole the coffee industry has fair prospects. Coffee production fell in Java between 1880 and 1910 to one-fifth of its previous amount. In 1911 and 1912 it improved again. In 1913 private planters exported about 19,500 metric tons, in 1914 about 20,000 tons, and in 1915 about 34,000 tons. The exports went mainly to

the Netherlands, Genoa, France, Austria, the United States, Port Said, and Singapore. It has been suggested that Java merchants might place sorted, roasted, and moulded coffee of the finer kinds on the market, instead of merely selling the prepared beans. This would involve building more factories and connecting them more closely with the coffee gardens. The growers have an agricultural association in Central Java for the promotion of coffee cultivation, though more might be done in this direction, and co-operation is needed to place the produce advantageously on the market. Local trade might also be developed, for the average consumption of coffee per head in Java is very small. The area of foreign trade might be extended, and the producer and the great retail merchants might work in closer connexion. In recent years the majority of coffee planters have recognized the speculative character of the trade and have combined with coffee-growing the cultivation of tea, cinchona, rubber, &c. Thus the crises in the industry, the attacks of leaf-blight, and in particular the serious fall in prices owing to Brazilian competition, have helped to bring about more promising conditions than at one time seemed possible.

Tea

After the passing of the Agrarian Law of 1870, whereby Government let out land on long leases, the cultivation of tea in Java, which had become free from Government control in 1865, but was in a declining condition, began to improve. From the time of the introduction of Assam hybrids in 1878, and pure Assam teas a little later, the industry increased steadily and rapidly. The present Java tea trade deals almost entirely with Assam tea and hybrids. The tea plant is hardy, and can be grown on different soils, at varying altitudes, and under all kinds of climatic conditions. Assam tea thrives in Java at a height of 6,000 ft. above sea-level, and yields more than in lower altitudes. The success of a plantation depends largely on the supply of cheap labour, and in Java labour is both cheap and plentiful.

The method of plucking the leaves of the tea plant depends on the quality of tea required. Young leaves of fine quality yield a smaller quantity but command a high price; coarser leaves give a larger harvest at lower prices. Java planters

appear to incline more to quantity than quality, which may explain the comparatively low prices of Java tea in the London market. The plucking is done entirely by women, who are paid according to the supply of labour and the distance which the leaves have to be carried to the factory.

The largest and one of the most modern of the Java tea factories is the Tanara Malabar factory, built in 1905, in which on an average 150 natives a day work under European supervision. Java has two testing-stations for testing tea-seed and carrying out investigations, at Buitenzorg and Salatiga in Central Java. There is also a tea expert office at Bandung.

The largest area of tea plantations is in West Java, especially in the Preanger Regencies, but tea cultivation is spreading in Central Java, though it has hardly touched the eastern districts. Plantations are usually from 500 to 3,700 acres in extent, and the capital involved in an average-sized factory is about £20,000. The great Malabar and Tanara estates form the largest tea-producing area under the direct supervision of one manager in the world, and have an output representing about $\frac{1}{2}$ per cent. of the world's total supply. They cover 3,000 acres, of which 2,000 are cultivated, and each year the output approximates to 2,500,000 lb. of tea of different grades and varieties. These factories employ about 3,000 natives under a European staff of about twelve officials. In many factories 'people's tea' is sold to the natives at a low price. This is specially the case in the Preanger Regencies, where in 1915 about 39,500 acres were planted with tea of this description. The total number of plantations in Java growing tea alone or in conjunction with other crops was 286 at the end of 1915, covering an area of about 182,000 acres. Of these plantations, 195 were in the Preanger Regencies, 41 in Batavia, and 13 in Pasuruan. The remaining residencies had less than ten tea plantations apiece. The production of tea from these estates in 1915 was more than 30,000,000 lb. in excess of that of the previous year.

The exports of tea from Java in 1915 amounted to about 92,000,000 lb., in 1914 to nearly 65,000,000 lb., and in 1913 to about 59,000,000 lb. The tea was shipped to the Netherlands, England, Russia, Canada, the United States, Australia, and Singapore. The direct shipments from Java to London increased in 1915 by more than 2,000,000 lb.

Cocoa

The cacao-tree was imported into the East Indies by the Spaniards, and has been cultivated for the market in Java since the second half of the eighteenth century. Of the two main cultivated varieties, *criollo* and *forastero*, only the first was grown in Java till 1886, when a specimen of *forastero* was introduced into the Jatirungu estate in Semarang, which produced by crossing with the Java *criollo* the Jatirungu cocoa hybrid. Cocoa cultivation is principally carried on in Central Java, but in some places it has been abandoned to make room for rubber and *Robusta* coffee. Though Java cocoa beans are esteemed in the European market, there are obstacles to the development of the industry. The cocoa-tree, especially the Java *criollo* variety, is susceptible to disease, and suffers greatly from insect pests, in particular the *helopeltis* or 'Assam tea-bug', which can destroy entire crops. It is also very dependent on soil and climate. Hence the number of cocoa estates in Java fell between 1908 and 1914 from 118 to 43, and the production of cocoa declined by about 50 per cent. In 1914 there were about 15 cocoa estates in Semarang, 8 in Pasuruan, and smaller numbers in Kediri, Pekalongan, Surakarta, Besuki, the Preanger Regencies, Surabaya, and Batavia.

In 1915 Java and Madura exported 1,481 metric tons of cocoa; in 1914, 1,583 tons; in 1913, 2,260 tons. The bulk of these exports went to the Netherlands, but Great Britain and Singapore were good purchasers. In 1915 the fall in exports to Europe was somewhat counterbalanced by an increased demand from the United States.

Tobacco

Forced tobacco cultivation, which had not proved a success, was abandoned about 1864. After 1864 private plantations were extended, and tobacco cultivation was concentrated in the districts best suited to its development—Besuki, Pasuruan, and the principalities. The European planters pushed the export trade energetically, sending the bulk of their produce to Holland. But from 1864 onward the Sumatra tobacco industry became a rival to the Java trade. Java was at this time producing both tobacco-leaf for the covers of cigars and *krossok*,

the tobacco used inside the covering leaf. It was in the production of leaf-tobacco that Sumatra excelled, and the Java planters were compelled to accept lower prices for their product. Still, since Java tobacco was comparatively inexpensive and of uniform quality, the industry held its own, and the yearly export increased, though its value had declined. In the fifty years between the abolition of forced Government culture and 1914 the export of tobacco increased almost five-fold, rising from 107,000 bales in 1865 to 490,000 bales in 1914. There were 84 tobacco factories in Java in 1914, 41 in Pasuruan, 35 in Besuki, 35 in the principalities, and the remainder in Batavia, Pekalongan, Banjumas, Kedu, and Kediri. The security of land tenure in the principalities, owing to the system of long leases, has tended to improve tobacco cultivation, which is, moreover, under European supervision. Whereas in the principalities tobacco is exclusively grown on *sawahs*, in East Java *tegal*, or dry fields, are also used for tobacco culture. The tobacco crop is planted after the rice harvest, in the spring, generally sufficiently late in the season to give it a chance of rain before the harvest, which is from two and a half to three months after the planting. Much tobacco is grown for the native market, particularly in Besuki and Kedu. Primitive nurseries are laid out in or near the *desas*, sometimes under trees, to avoid the trouble of making a shelter. The general method of cultivation differs little from that followed by European growers, except that it is less carefully carried out. An artificial aroma is sometimes produced by treating the tobacco with odoriferous resins, hemp, or opium. The exports of tobacco from Java amounted to 60,789 metric tons in 1913, to 49,433 tons in 1914, and to 61,871 tons in 1915. The bulk of this tobacco was shipped to the Netherlands, where large consignments of leaf tobacco and *krossok* were purchased. Cut tobacco, however, was chiefly exported to Singapore, and, in much smaller quantities, to Penang.

Indigo

The once profitable and important Java indigo industry is now comparatively insignificant. Yet Java indigo ranks next to that of British India in the market, and the indigo plant flourishes in the island. The industry reached its height under the Culture System, when the State made large profits by

oppression of the native population. By 1865 the Government monopoly was abandoned in Java, and from that year the bulk of the Java indigo came from private plantations on leasehold estates in the principalities. At the present time indigo is cultivated on a small scale by both natives and Europeans. Indigo is often grown by natives on *tegal* or dry fields, while, except in Pasuruan, Europeans grow it on *sawahs*, generally after a rice crop. The best indigo comes from the principalities, especially from Surakarta. The chief market is at Semarang. The European *entrepôts* are Rotterdam and Amsterdam, but France imports directly. Since the invention of artificial indigo the industry has tended to rely more and more on the Far Eastern market. In 1915 there were nineteen European indigo plantations in Java, with an area of about 4,700 acres, and about 4,800 acres were under native indigo cultivation in Java and Madura. Between 1913 and 1915 the yearly export of indigo rose from 76 to 314 metric tons.

Coca

Cocaine is prepared from the leaves of the coca shrub, which grows well in Java at a height of 1,000 to 2,000 ft. above sea-level. It is generally raised as a second crop or as a catch crop. It is also sometimes grown in hedges. The young leaves are exported on a large scale, and there are two cocaine factories in Java—at Sukabumi and Ungaran. Amsterdam, the chief European market for coca, has also two factories. The exports of coca leaf from Java and Madura reached 1,333 metric tons in 1913 and 1,353 tons in 1914, but dropped to 777 tons in 1915. The area under coca cultivation in Java, exclusive of Madura, was about 5,000 acres in 1915, distributed among seventy-three estates in Kediri, Pasuruan, the Preanger Regencies, and Bantam. About half this area was exclusively devoted to coca cultivation. On the remainder coca was grown in combination with other crops.

Fibres

The most important fibre-yielding plants of Java are kapok, cotton, different kinds of hemp, and rattans. The fibres of the coco-nut and areng-palms, *widuri*, a kind of wild vegetable silk, and other native products, are of local rather than of international value.

Kapok.—The kapok industry is still young, but it is thought likely that it may increase to double its present size. The Malay Archipelago produces about seven-eighths of the world's production for export, and by far the largest proportion comes from Java and Madura, where the kapok tree grows freely, and yields a better product than in any other country. It is found everywhere on land under native cultivation, along the fields and roads, and on some estates under European management. Of about 68,000 acres in Java and Madura which were planted with kapok in 1911 more than 52,000 were cultivated by natives. Kapok is chiefly grown in the Japara district, but small quantities of specially good quality come from Madura, and a considerable amount is raised in the east of Java. The export trade in kapok has only acquired importance since the beginning of the twentieth century. Some of the factories are managed by Chinese, but the trade is almost exclusively in the hands of European exporters in the principal ports of Java ; though a few European planters ship direct to foreign purchasers. The chief markets for Java kapok are found in the Netherlands and in Australia. Direct shipments are made, however, to America, France, Germany, Italy, and Spain. In England, Norway, Sweden, and Russia the demand for kapok, though still comparatively small, is on the increase. The exports of kapok from Java and Madura rose from 8,377 metric tons in 1910 to 9,017 tons in 1913, 9,353 tons in 1914, and 10,858 tons in 1915. The area under kapok cultivation in Java, exclusive of Madura, was about 27,000 acres in 1915. About 11,000 acres were planted with kapok alone ; on the remainder kapok was grown in combination with a variety of other crops. There were ninety-two kapok estates, of which twenty-eight were situated in the Semarang Residency.

Cotton.—The cotton trade, though of ancient origin in Java, is in a somewhat backward state. The production of cotton is chiefly for the home market, the culture is almost entirely in native hands, and even in the native market home-grown cotton has to compete with the cheap woven goods and cotton yarns imported from Europe. European cotton yarn is, as a rule, stronger and finer than the Javanese product, as the Java cotton fibres have short threads, and are not very satisfactory for spinning and weaving. The cotton plant, which is indigenous in Wemak and Kediri, is often planted by the natives

as a second crop or as a catch crop after rice, on *sawahs* or on dry fields. The co-operation of European capital in the cotton trade has been chiefly confined to buying the raw product and dealing in it, or to supplying seed and cleaning the raw cotton, and the cotton cultivation attempted by European planters has not been successful. Nevertheless, as an additional crop, cotton has been sufficiently profitable to warrant some hope of its future development, though this is perhaps more likely to take place in the Outer Possessions than in Java. The export of cotton certainly seems to have risen steadily if slowly from 1910 to 1912, but between 1913 and 1915 it was inconsiderable, and the effort which was made to establish an export trade in oil-yielding cotton-seeds proved a failure.

Hemp.—The agave plant, which has only been cultivated in Java for commercial purposes since the beginning of the twentieth century, grows wild in the archipelago. Many agave plantations were started between 1903 and 1905, when the market prices of hemp were very high. *Agave Cantala*, or Cantal hemp, appears to be indigenous in Java, where it grows luxuriantly. Its fibres are thinner, more flexible, whiter, and better suited for spinning than the coarser fibres of the other main variety, *Agave Rigida Sisalana*, or Sisal hemp. Hence good Java Cantal fibre fetches a better price than Sisal fibre. Agaves are easily cultivated and yield well in Java. The chief ports of export for agave fibres are Surabaya and Semarang, and the exports to Europe show a steady increase. Manila hemp is made from the leaf sheaths of the great banana plant *Musa Textilis*, which is not indigenous in Java, but grows well when it is introduced into the island. It is cultivated alone, or grown as a second crop on rubber estates. In 1913 Java exported 8,741 metric tons of Cantal and Sisal hemp and 232 tons of Manila hemp. In 1914 the exports rose to 13,303 tons for Cantal and Sisal hemp and fell to 62 tons for Manila hemp. In 1915, 13,231 tons of Cantal and Sisal hemp were exported, and 119 tons of Manila hemp.

Vegetable Oils

Copra.—Java possesses an abundance of oil-yielding plants, but the home consumption of oil is very large and the exports are comparatively small. The coco-nut still supplies much of the oil used by the natives for domestic purposes, but it has been to

a great extent supplanted as a lamp oil by the cheaper kerosene, with the result that large quantities of coco-nuts have been thrown on the market, and the trade in copra has enormously increased, while the growing value of this product has led to a great extension of the area planted with coco-nut trees, especially in Central Java. Nearly all the coco-nut plantations are in native hands, as European capital has only recently been attracted to the industry.

When the native demand for coco-nut oil has been met there remains a supply of nuts which can be used in the preparation of copra. The owner of the coco-nut trees may deal with his own fruit, or the fresh nuts may be sold in the open market to oil or copra manufacturers, who are usually Chinese, occasionally natives, but very rarely Europeans. Central Java is the chief seat of the industry. Large quantities of copra oil are consumed in the archipelago, and the manufacture of this oil is steadily increasing in Java, where there are several well-equipped factories. The export of home-manufactured copra oil beyond the immediately adjacent countries is still in an experimental stage, but the residuary oil-cakes are usually exported. The export of coco-nut oil was about 24,000 gallons in 1915, an extraordinary increase from 1914, when only about 6,000 gallons were exported. The copra and coco-nut oil export trades were on the whole, however, unfavourably affected by the war. Prices fell, and the export of copra dropped from about 70,000 metric tons in 1914 to about 51,000 tons in 1915. Copra was declared contraband by England and France, a copra bureau was established at Amsterdam to regulate the trade, and not only was the export to the Netherlands limited, but ultimately the export of coco-nut oil was stopped altogether.

Ground-nuts are an important product : they are cultivated on *sawahs* as a second crop between two rice crops, on unirrigated land, and on sugar-cane plantations directly after the cane harvest. The cultivation is in native hands, and the trade was formerly considered only fit for Chinese, to whom and to natives the preparation of oil from ground nuts was left. In the European market Java ground-nuts were considered inferior to those grown in Africa. But since about 1904 the conditions of the industry have changed, and Java nuts now hold their own with the African product in Europe. Early-ripening kinds have been introduced, to replace the old slowly-

developing Java variety, and at the end of 1915 about 145,000 acres were planted with ground-nuts in Java and Madura, and the area harvested amounted to about 458,000 acres. The largest area under this cultivation was in East Java. The demand from the Netherlands has recently greatly increased, owing to the need for materials for the margarine industry.

Kapok Seeds.—The third place among the oil-seeds of Java, as far as value is concerned, may be assigned to the seeds of the kapok-tree, which until about 1905 were thrown away as useless. Part of the abundant supply is now exported to Europe, while the remainder is used for oil-making in Java. The oil factories are generally in Chinese hands. The oil is used in native cooking, and as an ingredient in the manufacture of hard soaps. The residuum serves as manure on the sugar estates and is utilized in Europe as food for cattle.

Other Vegetable Oils.—The small export trade in cotton seeds has ceased since about 1912, though two cotton ginneries were recently started in Java, one of which was connected with an oil-mill. The export of castor-oil seeds from Java is also small, though there is a fair demand for them for medical and technical use. The industry as a whole is not flourishing, and the cultivation of the castor-oil plant is declining. In some parts of Java the natives extract oil from sesame seeds, and the trade in kachang (*katjang*) oil, derived from the soya bean, is not unimportant. In 1915 the export of this oil amounted to more than 33,000 gallons. In the same year nearly 3,000 metric tons of oil-yielding *jarak* kernels were exported to Europe from Java and Madura. Many East Indian trees, shrubs, and grasses yield essential or volatile oils. The Java variety of the grass from which citronella oil is distilled will, under good conditions, give a better product than the Ceylon variety. The oil is exported to Europe and used in the manufacture of soap. Lemon-grass oil is also distilled in Java and exported to Europe, but the trade in this article is insignificant, and the plantations of lemon grass in Java are said to have been to a great extent given over to *sereh* grass. Canagra oil comes from the flowers of a tree which is chiefly found in West Java. The natives have long prepared it for their own use. It is only recently that exporters have turned their attention to it as a possible source of commercial profit, and it is now exported in increasing quantities to Europe and the United States.

Spices

Java does not rank among the true spice islands of the East Indian Archipelago. None of the finer kinds of spice is indigenous to the island, and though many of them thrive when planted, the spice production is comparatively small. Java has, however, some export trade in pepper, nutmegs, and mace. Pepper was once the principal export and one of the compulsory levies under the Culture System, but the chief pepper trade has now passed to the Outer Possessions, though Batavia is the collecting centre for Banka and Sumatra pepper. The exports for 1913 were 2,058 metric tons of white and 5,300 tons of black pepper, for 1914 the exports were 1,947 tons of white and 8,394 of black pepper, and in 1915 the export of white pepper fell to 788 tons, but 6,788 tons of black pepper were exported from Java. The chief purchasers were the Netherlands, Germany, France, England, the United States, and Singapore. Nutmegs and mace form an important subsidiary crop on estates in Java which are owned by Europeans. Both are exported, chiefly to the Netherlands and to England. The exports of mace are smaller than those of nutmegs, but the demand for both leaves and fruit is fairly steady. The cultivation of cinnamon has practically died out in Java since 1865, when the compulsory levies were dropped. The native Javanese, who do not care for black pepper, cloves, or nutmegs, eat various kinds of capsicum in great quantities. The small pungent capsicums known as chillies grow wild, and other species are cultivated by the natives on wet and dry rice-fields after the rice harvest. Central Java, the only part of the island where there is a surplus, exports a few hundred tons yearly from Semarang to Singapore.

FORESTRY, FOREST PRODUCTS, ETC.

The forests of Java, though they cover only one-thirteenth of the total area, are of high economic importance. The teak forests are famous, and the island is rich in many other kinds of timber trees, and in various species of palms and fruit-trees.

Forestry Administration

The Government has found it necessary to undertake the administration of the forests in Java, and the special importance

of teak is shown by the accepted division, for administrative and commercial purposes, into 'teak forests' and 'wild timber forests', including all other species. The area of teak forests is estimated to be rather more than 1,500,000 acres, and that of 'wild timber' forests between 2,000,000 and 2,500,000 acres. In early days little care was taken to preserve the forests in Java, or to consider the effect of the destruction of mountain timber on the water-supply. The native dry or *ladang* system of agriculture involved reckless destruction of forest trees, and the East India Company exploited the forests in its own interest. Heavy fixed contingents of teak were imposed on the native chiefs, and these were, as far as possible, provided by the inhabitants of certain *desas* in the neighbourhood of the forests, who devoted themselves to this work, and were exempted from other forced services. The native word for the felling and hauling of wood is *blandong*, and the Javanese who performed this compulsory service were called 'blandong people'. The Chinese, too, were allowed to fell wood for building their coasting vessels, and this led to great inroads on the extensive Rembang teak forests. By the second half of the eighteenth century most of the accessible teak woods on the north coast of Java were nearly exhausted, and by the end of the century attention began to be called to the decline of these forests. After the fall of the East India Company the Government took over all teak forests which were not the property of private individuals or communities as State lands, while special treaties, modified from time to time, were made with the principalities. In 1819 the whole forest service was reorganized, but the introduction of the Culture System in 1830 was followed by the virtual abandonment of the old regulations for the management of the forests. The Culture System involved the building of sugar factories and indigo factories and the use of large quantities of fuel, while the establishment of tobacco factories and plantations, especially in Rembang, did much to bring about the destruction of the teak forests. Large quantities of wood were also used for defensive and other public works. The forests were put under the Director of Culture in 1832, and from 1857 trained forest officials were regularly sent out from Holland, while a resident inspector of forest service was appointed. Timber-felling was now concentrated as far as possible on certain spots, sale by lot was reintroduced, the

cleared ground was resown with teak, and the whole service was supervised by European and native officials. The old *blandong* system, however, remained in force till 1865, when it was abandoned. In Rembang the ' *blandong* people ' divided the working year into two portions : from April or May to November was the period of felling and hauling and of the conveyance of the timber to the rivers, and from the beginning of December to the following spring, the season of the wet monsoon, was the time for floating the timber-rafts down the rivers. With the increase in the demand for wood in the second half of the nineteenth century the Government teak monopoly was felt to be a hindrance to industrial development. After various experiments, the Colonial Ordinance of 1897 brought the forest officials under the direct control of a special Forest Service, which was subsequently transferred to the new Department of Agriculture, Industry, and Commerce. Finally, an Ordinance of 1913, which came into force on January 1, 1914, established new forest regulations for Java and Madura, which promoted State exploitation and management as against the system of private agreement and sale which had grown up since 1864, when State exploitation of the teak forests had been abandoned in favour of private competitive enterprise. The new system, which reflected a change in public opinion, was rendered more easy of application by the increasing efficiency and wider organization of the Forest Service. The teak and ' wild timber ' forests are divided into districts managed by rangers with a staff of subordinate officials. The higher officials are mainly European, with native subordinates, and the general administration is under the immediate direction of a chief inspector, supervised by the Director of Agriculture, Industry, and Commerce.

In 1904 the course of training for forest officers was connected with the newly-founded Royal Higher School of Agriculture, Horticulture, and Forestry, but both European and non-European forest overseers are in future to be trained in a special school. A forestry experimental station to deal with scientific and technical questions was started in 1913. Under the reorganized Forest Service the capital value of the forests has greatly increased, and the financial profits, though they showed some diminution in 1914, have also risen considerably.

Teak

The forests on the low-lying ground consist in large part of the teak-tree, the native *jati*, the valuable 'Java teak' of commerce. The teak-tree is found in British India and in several islands of the Malay Archipelago, but nowhere in such abundance as in Java. It is peculiarly fitted for shipbuilding, and is largely used for house-building, furniture-making, and many other purposes.

In Java the teak forests are mainly situated in the centre and east of the island. In the mountainous volcanic regions of the west they occupy only a small area. In a vertical direction teak has a somewhat restricted extension. A height of little over 2,000 ft. above sea-level may be taken as the limit of the Java teak forests. In Central and East Java teak grows in the low-lying districts, by preference on somewhat hilly ground, such as the hills which stretch out from the eastern foot of the Ungaran Mountains in Surabaya. Of the area covered by teak forests (rather over 1,500,000 acres, as already stated) more than 500,000 acres are situated in the residency of Rembang, while the remainder lie chiefly in the residencies of Madiun, Semarang, Surabaya, and Kediri. In the other residencies teak grows in small quantities or is altogether absent.

The exports of teak from Java and Madura amounted in 1913 to 1,383,915 in 1914 to 1,220,153, and in 1915 to 702,976 cubic feet.

Coco-nut Palms

The Javanese distinguish two main groups of coco-nut palms—the *Kalapa gendjah*, which bears fruit in its third year, but loses its productiveness comparatively early, and the *Kalapa dalem*, which matures slowly, but retains its productive powers for a long period of time. Although the coco-palm thrives best in tropical heat on low ground near the sea, it will grow at a height of 3,000 ft. above sea-level; but these mountain palms are usually cultivated for sap rather than for fruit. The coco-palm bears fruit throughout the year, and plays a prominent part in the life of the Javanese peasant, who plants it close to his house, since it is popularly supposed to languish when it is beyond the reach of the human voice. It

is grown on a large scale on private estates, and the Dutch Government has encouraged its cultivation on waste lands. (For the copra industry, see above, p. 326.)

Fruit Culture

Attempts have been made to introduce the fruits of more temperate climates, but without any striking success, and Java and Madura have a considerable import trade in fresh fruit with Europe, Singapore, China, and Japan, and, in particular, with Australia. The chief fruits imported are grapes, apples, pears, oranges, lemons, cherries, plums, peaches, and apricots. The vine was at one time cultivated in East Java, but the Dutch East India Company, fearing competition with the South African wine trade, discouraged Javanese viticulture, and it gradually died out. The green Java orange is cultivated in the east of the island, but not in sufficient quantities to preclude importation, and lemons are comparatively scarce. Although in 1911 about 66,000 acres of orchard ground were assessed for land-rent in Java and Madura, fruit-culture is still backward, and the remarkable natural wealth of the islands might be utilized to much better purpose. The natives plant fruit-trees, notably the *blimbing*, in their villages, but wide expanses of orchard planted with one kind of fruit are rare. Such native fruit-gardens or orchards (*kebonan*) as exist are usually dry (*tegal*) fields, on which grow a few coco-palms and mangoes, duku, mangosteen, nangka, jambu, rambutan, and other fruit-trees, with perhaps some *pete*-trees, the unripe seeds of which taste like garlic, and *so*-trees, which yield edible fruits and leaves as well as useful fibres. These orchards are generally outside the *desa* or village, as there are many superstitions and traditions connected with the planting of certain trees near houses, but the natives easily give them the small amount of necessary cultivation, which consists chiefly in irrigation and in the preservation of the fruit-crops from birds. The Chinese and Arabs are better gardeners and fruit-growers than the Javanese, and the wealthier among them pay high prices for choice kinds of table-fruit. Of late years the Dutch in Java have recognized the importance of fruit-culture and have made efforts to encourage it, especially among the natives. There are extensive guava orchards or gardens near Semarang, and orchards of various sorts of citrus trees between

Batavia and Buitenzorg. At Buitenzorg, also, a society has been formed to promote fruit-growing, while in Demak the *blimbing* has been successfully cultivated on a large scale by native enterprise, and mangoes are grown for the market in the Cheribon and Probolinggo residencies. There is little doubt that there are openings in Javanese fruit-culture both for increased production and better distribution in the home market and for the preserving, canning, and exportation of native produce.

Rubber

The rubber industry of Java has assumed great importance of late years. In former times practically all the rubber produced in Java came from *Ficus elastica*, the native *karet*. The systematic cultivation of these trees for commercial purposes dates from about 1864. By 1900 a considerable number of rubber plantations had been started in West Java, and the Forest Department was beginning to pay attention to rubber-planting. The simple early methods of tapping have now been replaced by more elaborate and scientific methods. Attempts to introduce the South American rubber-tree, *Manihot Glaziovii* have not been very successful, while the Central American *Castilloa elastica* has disappointed the expectations of its growers, and by 1913 the area planted with it in Java had shrunk to about 7,000 acres, and its yield of rubber was only about 2 per cent. of the total output. All other species of rubber-tree, including the *Ficus elastica*, have yielded to *Hevea Brasiliensis*, which produces the Para rubber of commerce, first planted in the Experimental Gardens at Buitenzorg in 1876. Though it thrives best in low situations, it does well in West Java at an altitude of nearly 2,000 ft. above sea-level. Other crops, such as *Robusta* coffee, or leguminous plants, are often grown between the rubber-trees to provide vegetable manure.

In 1914 there were 408 rubber estates in Java, exclusive of Madura, of which 81 were in the Preanger Regencies. On private estates growing rubber alone the acreage under *Hevea* was nearly five times as great as that under *Ficus elastica*, while other kinds of rubber occupied proportionately smaller areas. The total area under rubber cultivation, exclusive of Government estates, was estimated in 1914 at about 248,000

acres, 152,000 of which were planted with one or more crops in addition to rubber. The Government rubber estates covered about 22,000 acres, in round numbers, and here, too, *Hevea* preponderated. Government rubber cultivation has long been part of the work of the Forest Service in Java, and in 1910 the management of the Government rubber industry was concentrated under an official of the Forest Department. Since 1910 the service has been further organized and specialized, and *Hevea* trees have been planted, while attempts have been made to improve the yield of the old *Ficus elastica* plantations.

In 1911 the Netherlands Commercial Company took over the sale of Government rubber, and the sales were transacted alternately at Amsterdam and at Rotterdam. The number of Government factories has increased, and the produce is said to have doubled yearly since 1910. The capital invested in rubber in Java in 1913 amounted to nearly 117,000,000 florins. In 1913 the exports of rubber from Java and Madura were estimated at 2,570 metric tons, of which 2,345 tons were *Hevea*. In 1914, 3,812 tons were exported, of which 3,607 were *Hevea*, and in 1915 the total export was 7,458 tons, of which 7,304 were *Hevea*. The *Hevea* rubber was chiefly purchased by the Netherlands or by Great Britain, while in 1913 and 1914 Belgium, the United States, and Singapore also bought, in smaller quantities. France and Germany took a few tons in 1914, and Japan became a purchaser to the extent of 117 tons. The most remarkable recent feature of the trade was the rise in the export of *Hevea* rubber to the United States, from 20 tons in 1913 to 186 tons in 1914, and 3,336 tons in 1915. The *Ficus elastica* rubber was mainly bought by Great Britain, the Netherlands, and Singapore. It was reported in October 1918 that the export of rubber from Netherlands India had been prohibited.

Gutta-percha is also an East Indian product. It is obtained from various trees of the *Sapotacea* family. There is a State nursery at Chipetir in Java for gutta-percha-yielding plants and also an experimental gutta-percha factory. In 1914 between 2,000 and 3,000 acres of Government land in Java were planted with the *Palauquium* species of gutta-percha tree.

Cinchona

Since the middle of the nineteenth century Java has been the principal source of the world's supply of cinchona, *kina*, quinine, or Peruvian bark. The Pengalengan plateau in the Preanger Regencies is the centre of the cinchona industry. In 1914, out of a total of 97 plantations, 69 were in the Preanger district, including the seven estates still held by the Government. Cinchona is grown on cleared forest ground and on terraced hill slopes. In spite of a crisis in 1893-4, the cinchona industry has made rapid progress in Java since 1880. In 1886 the cinchona of Java was already about two-thirds of the world's supply, and by 1910 Java was producing more than 8,500 tons annually, while 450 tons was the approximate yearly produce of British India, and 200 tons was that of all other countries. In 1915 the area under cinchona cultivation was about 35,000 acres for 109 plantations. In 1914 statistics were returned for 112 estates, including 7 Government plantations, 101 leaseholds, and 4 private estates. Till 1896 Java cinchona was sold by public auction in Holland. This resulted in a combination of great quinine manufacturers, chiefly in Germany, to keep the prices of the raw material low, and the Java industry was seriously threatened. In 1896 a company was formed to prepare the bark and extract the alkaloids in the island, and a quinine factory was established at Bandung, in the Preanger district, which now produces some of the finest quinine in the world, and has a considerable export trade. The company has its head-quarters at Samarang, and the quinine is sold by auction at Batavia. Home factories of this kind might perhaps be used by Government to supply quinine on easy terms to the Javanese natives. Almost the whole export of Java cinchona bark goes to the Netherlands, and in 1913 the producers of bark in Java made an agreement with the owners of certain quinine factories in Europe, whereby a combination of factories arranged to take the Java bark up to a guaranteed quantity, containing a specified amount of quinine, at a minimum price. A central office was established at Amsterdam to control the receipts, deliveries, and analysis of bark, and to fix the prices at which it was quoted.

Rattan

The rattan or rottan is the stem of certain species of palms, belonging chiefly to the *Calamus* family. It is found in much smaller quantities in Java than in Borneo, Celebes, and Sumatra. Java even imports rattans from Borneo. The Java rattan trade is in the hands of Europeans and Chinese. The cut stems are exported in considerable quantities to Europe and America, where rattan is much used in the manufacture of furniture and trunks, and in basket-work. In 1913 the exports amounted to 101 metric tons, in 1914 they fell to 99 tons, and in 1915 they rose again to 753 tons.

LIVESTOCK

Though the Javanese do not concern themselves much with horse-breeding, stock-raising, or dairy work, there is a breed of small strong horses in the island, used chiefly for riding, draught, or transport. The humped Java cattle tend to degenerate, and are often crossed with the beautiful wild cow or *banteng*, to strengthen the breed. The wild cattle come principally from the forests of the Pasuruan district. The flesh of the young *banteng* makes excellent meat, and the hide of the older animals is used for leather. The flesh of the buffalo is a common article of food, and in addition to its value in ploughing and other farm-work, the animal yields good milk. The well-stocked native poultry-yards and the abundant supplies of fresh- and salt-water fish further provide plentiful food to supplement the standard diet of rice, but the Javanese remain primarily a rice-eating people.

PETROLEUM AND OTHER MINERAL PRODUCTS

Java is not rich in minerals, with the exception of petroleum, but the petroleum trade, though of recent introduction, offers great possibilities of commercial expansion, especially in the markets of the Far East. Petroleum is found in Semarang, Rembang, and Surabaya. Since its beginnings, in about 1890, the industry has made rapid progress under the main direction of the Royal Dutch Company for working petroleum springs in the Dutch Indies and the Dordrecht Petroleum Company. By 1908 twenty-eight petroleum concessions had been granted in Java, and the industry is now one of the most important in

the island, although reports of production show a slight decrease in 1916 compared with the previous year, whereas substantial increase was recorded elsewhere in the archipelago. Petroleum working is regulated in Netherlands East India by the Mining Act of 1899 and the supplementary enactment of 1906, and since 1910 petroleum working has been almost entirely under Dutch control. The deepest well drilled in the island is in East Java. There are large refineries at Wonokromo in East Java, where the raw oil is evaporated into benzine or petroleum spirit, kerosene or illuminating oil, liquid fuel, lubricating oil, and sometimes paraffin-wax, from which candles and *batik* wax for the native *batik* work are made. Java has special paraffin factories, fitted with all modern appliances, which produce a large quantity of excellent wax. A lubricating-oil factory has also been started. The petroleum oil of Java has a low specific gravity and high contents of benzine and lamp oil, but in 1915 the island was still importing considerable quantities of kerosene from the United States.

Coal-mining has been attempted in Java, and there is a fairly promising eocene coalfield at Bajah in the south of the Bantam residency. Lignite has been found in various parts of the island, but it is of poor quality and of no great value. Though there is coal in Jokyakarta and in a few other districts, none of the seams shows special promise.

A little iodide of copper is found in Semarang and some manganese in Jokyakarta.

Salt, which is a Government monopoly, is obtained from saline springs and from sea-water. In Madura a Government manufacture of salt from sea-water is carried on by European methods.

CHAPTER XI

ECONOMIC PRODUCTS OF THE OUTER POSSESSIONS

Sumatra and adjacent islands—Borneo—Celebes—Moluccas and New Guinea—Lesser Sunda Islands.

IN dealing with the economic products of the Outer Possessions it is desirable to distinguish, more explicitly than in the case of the more fully developed industries of Java, between production which is purely in native (or non-European) hands, and production under European control. The following sections on each territorial division therefore deal successively with (a) native production, and (b) European enterprise, even though this involves the consideration of certain commodities under both headings. In the majority, again, as concerning 'native' production, a distinction is necessary between production by dwellers in the interior and that by the coast peoples.

SUMATRA AND ADJACENT ISLANDS¹

Native Production

Rice.—Native agriculture in Sumatra is largely concerned with the cultivation of rice. As in Java, this is carried out on *ladangs* or dry fields and on *sawahs* or wet fields, but, owing to the inferiority of the general standard of civilization, the lesser density of population, and the absence of education in scientific methods, the average level of the culture is lower. The use of manure, however, is peculiar to Sumatra.

Ladang culture exists side by side with *sawah* culture in many places, and in the inland districts of Middle Sumatra it preponderates. The care bestowed on this method of cultivation varies in different parts. The Batak peoples, for instance, clear a space by burning trees and brushwood, and the ground thus cleared receives little or no working. This method involves

¹ Including Riouw-Lingga, Banka, Billiton, &c.

the destruction of much valuable timber, and the ground itself soon becomes useless, with the result that from time to time the community is compelled to remove to another locality. In the districts of Rawus and the Lebongs in Palembang, on the other hand, the ground is more thoroughly cleared, and is subsequently well worked with a plough drawn by buffaloes. Here the seed is transplanted from seed-nurseries. Where *ladang* culture is in vogue the period of ripening occurs during the rainy season, at the end of which the rice is harvested.

Sawah culture is most successful in the West Coast Residency, where the Menangkabau Malays have an ingenious system of irrigation, involving the use of water-wheels, which is peculiar to themselves. In the building of irrigation works the Malay is said to be the equal of the Javanese. In this region rice-cultivation in Sumatra reaches its highest level.

Besides the use of running water, rain-water is utilized, and in Tapanuli the natives construct rough *prises d'eau*. In Sumatra East Coast also the *sawahs* are dependent mainly on this source. In many places, including Aceh, rice is cultivated on marsh *sawahs*, but the results from the use of stagnant water are not favourable.

The relative prevalence of the two methods is not ascertainable with certainty. Official returns of 1914 give figures which cover only the two residencies of Benkulen and Palembang. In Benkulen, which was described in 1905 as entirely devoted to *ladang* cultivation, reference is made in the statistics of 1914 to 38,500 acres on *sawahs*. Judging by the harvest figures, however, *ladang* culture in this residency still greatly predominates. In Palembang five times the area devoted to *sawahs* was cultivated by the dry method, and this is just as widespread in Jambi, where *sawahs* are mainly confined to the districts of Korinchi and Bangko. In these places the rice culture is so successful as to permit of export to the residency of Sumatra West Coast. On the mainland of Riouw and Dependencies the culture seems to a great extent to be on marsh *sawahs* inundated by the overflow of the Indragiri and the Retih. In Aceh *sawah* culture, chiefly in the Pidir valley, is much more common than *ladang*, and occurs on irrigated and marsh ground.

In 1910 the Government appointed two engineers to inquire into the question of irrigation in Sumatra, and in 1912 irrigation engineers were appointed for Aceh, the government of

Sumatra West Coast, Benkulen, and Palembang. In 1914 expenditure on irrigation works is recorded in Aceh, Sumatra West Coast, Tapanuli, and Benkulen.

Judging by the statistics given for Palembang, the rice crop is subject to serious misadventure. During 1914 a quarter of the crop, mainly on *sawahs*, was destroyed by a long drought. In the wilder parts of the island the rice grown on the *ladangs* suffers from the inroads of wild animals, against which it is necessary to keep a constant watch.

Agricultural advisers appointed by the Department of Agriculture, Industry, and Trade are stationed at Kuta Raja in Aceh, and Muara Enim in Palembang, while at Fort de Kock in the government of Sumatra West Coast, and at Benkulen, there are European agricultural instructors. In these places experimental gardens have been established for the enlightenment of native agriculturists and the improvement of the quality of the crop.

The harvest varies considerably from year to year, and export is naturally high in those provinces in which the convenient ports are situated. The export from Riouw and Dependencies in 1914 nearly trebled the amount exported in 1913, and this residency, with Sumatra West Coast (in which the port of Padang is situated), heads the export list. The smallest quantity exported came from the Lampongs. Much of the exported rice goes to Penang and Singapore. Although a large quantity is thus exported, the amount of imported rice is more than twenty times as great. In 1913 two-thirds of the imported rice went to the residency of Sumatra East Coast, presumably to feed the large coolie population. Apart from the import into this province, however, the amount imported was seven times as great as the total export, all the other provinces receiving large quantities. Much of the imported rice came via Singapore from the same sources from which Java is supplied (British India, Saigon, and Siam). In the course of 1915, as a consequence of the shipping shortage and the high cost of freights, the export of rice from Sumatra dwindled almost to nothing.

Maize.—Among other crops cultivated by the natives for food purposes maize is perhaps the chief. The Bataks in particular grow it on *ladangs* as a primary crop. Elsewhere it is produced as a secondary crop.

Vegetables of various kinds are everywhere grown to eke out rice for domestic consumption, and the potatoes of the Bataks have some reputation.

Coffee.—The bulk of the coffee produced in the Outer Possessions for export comes from Sumatra, where in the West Coast province the Government's Culture System had been in force up to 1907. Coffee is still extensively grown by the natives of Sumatra, and some varieties of the old Java coffee, such as the Mandailing of Tapanuli, which is in demand in America, and the Kru coffee from Benkulen, are important and profitable. But the growing of the average product is said to be unprofitable as far as the native grower is concerned. The berry ripens suddenly, and the assistance of hired labour is required to harvest the crop, with the result that the work is done hastily, with much damage to the trees. The helpers have to be remunerated with a disproportionate share of the harvest, and the excessively small price obtained from the Chinese middlemen, to whom the crop has been to a great extent mortgaged, leaves little or no profit to the grower. It is hoped that the depression of this culture will be remedied by the introduction of the inferior but hardier *Robusta* variety under the auspices of the Government. The harvesting of this crop extends over a long period, thus demanding the constant attention of the grower, who will also be enabled to deal with the whole harvest with little assistance. It is thought that the abundance of the harvest and the small cost of production will enable the growers to compete on favourable terms with exporters of Brazil coffee. For the purpose of encouraging the planting of *Robusta*, the agricultural and administrative officials have started experimental gardens, but the conservatism of the natives makes progress difficult.

The native crop is grown both in plantations (*tuinen*) and in the forest. Java coffee is principally grown, but *Liberia* and *Robusta* also. It is not possible to distinguish clearly the extent of native plantations or the quantity produced, but only to give general statements concerning those provinces in which the native growing overwhelmingly preponderates. The free native culture of Sumatra West Coast, which has succeeded the Government's Culture System, is responsible for the largest export, and from Padang 54,316 pikols, probably inclusive of 2,000 pikols from Tapanuli, were exported in 1914. Some may

also have come from Benkulen, which in the same year exported over 20,000 pikols to Padang, Palembang, Batavia, and Singapore. In Palembang 14,250 pikols of *Robusta* coffee were harvested as against 3,250 pikols of Liberia ; the export, however, was inconsiderable. In certain districts of Jambi, Muara Bungo, Korinchi (whence in 1914, 3,460 pikols of coffee were exported to the adjoining province of Sumatra West Coast), and Bangko, coffee-growing is extending. In Bangko during 1914, 700,000 shrubs were planted. During the last ten years export abroad has fallen off, while export to other provinces of the colony substantially increased.

Tobacco is extensively grown by natives for their own consumption as a secondary crop on rice-fields. A quantity of cut tobacco is produced for the native market, and a further insignificant amount of *krossok* or scrub tobacco for export abroad. Sumatra West Coast is the chief producing province, the best sorts coming from the districts of Lumindai and Lunto. In this region the Government is at some pains to advise the natives in seed selection and as to methods of overcoming plant diseases. In the Lampongs, Benkulen, and a few districts in Palembang there is regular cultivation for export, while in Acheh the culture has been started under the supervision of a Government agricultural adviser. The natives grow the tobacco under bond for European exporters, who maintain establishments for drying and storing the product. Tobacco for the European market goes to Holland and that for the native markets of the Archipelago to Singapore.

Pepper.—Pepper-growing is one of the oldest established industries in Sumatra. Both black pepper and white pepper are produced. In 1913, 18,126 tons of black pepper were exported as against 4,156 tons of white pepper. This included the export from Banka. A large quantity of the black pepper, exclusive of the amount exported *via* Java, was produced in the Lampongs, where pepper culture is the main occupation of the natives, and the proprietors of the gardens are men of wealth employing coolies from Java at the time of the harvest. The natives of Acheh and the Achinese settled in the Langkat district of Sumatra's East Coast were responsible for nearly all the rest of the black pepper production. A fair quantity came from Palembang, where the culture is confined to the districts of Ogan Ulu, Komering Uli, and Muarodon. The

production of white pepper, which requires more care and skill, is carried on largely in Banka and Dependencies, where the industry is organized by Chinese. Palembang, the Lampongs, and Riouw also export considerable quantities. The example of the Chinese in Banka is encouraging the natives to take the necessary pains, and now the culture is said to be their principal means of livelihood.

Gambir.—An industry which in the Riouw-Lingga Archipelago is carried on in conjunction with pepper is the preparation of gambir extract, which contains catechine and tanning materials, but is consumed in considerable quantities in the Malay Archipelago by chewers of betel-nut. In the Riouw-Lingga islands the culture and the preparation of the extract is organized by Chinese, who export a large quantity *via* Singapore to Java. From this region were exported, in 1913, 6,689 tons; 2,443 tons came from Sumatra East Coast, where Europeans are experimenting with the culture, and a considerable quantity from Sumatra West Coast.

Nutmegs, Mace, and Cloves.—For many years the culture of spices has been settled in the western districts of Sumatra, but it has never attained any great dimensions, and is carried on with profit only by natives on a small scale. In 1914 Sumatra West Coast produced 3,141 pikols of nutmeg and 742 pikols of mace. In the same year Aceh produced 1,320 pikols of nutmeg and 240 pikols of mace, and Tapanuli 491 pikols of nutmeg and 60 pikols of mace. Cloves are produced in only one or two districts of Benkulen, and the export is small.

Pinang.—Everywhere in Netherlands India the *pinang* palm is grown on village lands for the sake of its seeds (*pinang* or betel-nut). When these have been dried and the husk removed, the kernel is consumed by the *sirih* chewers. The young nut is also used as a medicine both for human beings and cattle. A huge quantity of these nuts (12,091 tons) was exported in 1913 from Aceh, and about one-third of this amount from Palembang. Most of the export is to Singapore and Penang, from which places the commodity is re-exported to British India, Cambodia, Indo-China, Siam, and Hong-Kong; a little goes to Java. At Singapore some of the nuts were boiled to extract tanning material, but owing to the state of the market the experiment did not develop.

Cotton.—Cotton-growing in Sumatra is practised on a small

scale in Palembang, where, cultivation by Europeans having so far proved unprofitable, it is still in native hands. Experiments under Government auspices have been made with foreign varieties, but these have been unsuccessful except in the case of the long-staple Bourbon, which is raised as a secondary crop on *Hevea* rubber plantations. The best results are obtained from well-selected indigenous varieties such as Bulu Kuching and Kapas Ulu. According to one authority, however, the staple of native cotton is not long enough for spinning purposes.

At present the raw product is collected by Arabs and Chinese, and is sold by them to merchants at Palembang, where there is a modern ginning installation. The total production of cotton in 1913 was about 9,000 tons, of which 411 tons were ginned at Palembang. Nearly the whole of this quantity was exported to Europe, where its ultimate destination was Germany. Nearly 8,000 tons were exported in an uncleaned state, and most of this would go to Singapore, where the bulk of Palembang cotton is cleaned before re-exportation. Marseilles took some, but the destination of the largest quantity was Japan.

Kapok.—A native culture which has developed during the last ten years is that of kapok fibre. Although the production in Sumatra, where it is entirely in native hands, is far behind that of Java, it is making rapid strides in certain districts, chiefly in Acheh. The bulk of the kapok at present comes from Palembang, which in 1913 exported 325 tons. The production in the following year was small, owing to drought, and in 1915 neither Acheh nor Palembang exported as great a quantity as in 1913. In Sumatra the preparation of the fibre is largely in the hands of Chinese, and it is in consequence not done so efficiently as in Java, where the work is organized by Europeans.

Copra.—For many centuries the natives of Sumatra have produced not only for their personal wants but also for the foreign market. This production was and still is largely financed and organized by Chinese and Arabs. The most important commodity thus produced is copra. The increasing value in Europe of the oil extracted from copra, which is used largely in the manufacture of soap, and latterly as an edible, has begun to attract European capital, but as yet the planta-

tions are mostly in native hands. An indication of the popularity of this culture can be gathered from a statement in the *Kolonial Verslag*, 1914, which records the extension of the growing of coco-nut trees in Benkulen on lands previously devoted to *sawah* culture. In the same year over 20,000 trees were planted in Billiton. The trees flourish almost anywhere round the coast, and at present the industry is most developed in Riouw and Sumatra West Coast, but is also considerable in Sumatra East Coast, Acheh, and Tapanuli; there is considerable export from Billiton. From Padang, in 1915, 17,268 tons were exported, this figure including some of the output from other provinces, principally Tapanuli. This represents an increase on the figure of 1913 of 2,784 tons. A comprehensive figure for the whole of Sumatra, including Banka and Billiton, is available only for 1913, when 40,900 tons of copra were exported.

In Sumatra the trade suffers through being in the hands of the Chinese; they advance a miserably small sum to the native grower, who takes little trouble over an enterprise from which he derives only small remuneration. This, and the desire of the exploiters to take advantage of the market, results in the nuts being plucked prematurely and artificially dried. Padang copra, which is of inferior quality, often cannot be sold immediately, and is therefore kept for a period from the market. The Government is endeavouring to induce natives to refrain from plucking unripe fruit, and also to dry the nuts in the sun rather than over fires, which seriously diminishes the value of the copra. Such advice is said to be useless as long as the present system of financing the industry obtains, and the Government has established a credit bank in Padang which will lend cheap money without imposing conditions on copra production.

Coco-nuts.—Besides the local trade in copra there is an important trade in the nuts themselves. In 1913 Banka exported 289,000 nuts to Jambi, and the Lampongs exported 672,000 to Java. The bulk of the oil made from the fresh nuts, which is used throughout the archipelago for culinary purposes, is consumed locally. Only the Government of Sumatra West Coast produces for the export trade, which is mainly inter-provincial. The eastern provinces of Sumatra are partially dependent on oil imported through Singapore from the residency of West Borneo.

Ground-nuts.—As a consequence of the demand in Europe for materials for the manufacture of margarine, ground-nuts were before the war beginning to be exported from Sumatra West Coast. In 1913 a total quantity of 488 tons, chiefly in husk, was exported from Padang; this export has since the war fallen off considerably.

Forest Products.—Various products, chiefly wild rubber, rattan, and resins, are obtained from the forests of Palembang and Sumatra West Coast. Wild rubber, or *jelutong*, is the product of trees belonging to the *Dyera* species of the *Apo-cynaceae* family, and in a lesser degree of the liana *Willughbeia firma*. Tracts of forest are exploited by associations of native collectors who have received permission from the Government. Indiscriminate felling of trees is forbidden, and a system of tapping is prescribed. After slight treatment the rubber is delivered to Chinese traders for export. Palembang is the chief port for this trade, and in 1914 exported 2,042 tons. The Palembang *jelutong* is said to be superior to that obtained in Borneo, but as a result of the fall in rubber prices there has been a considerable decline in the quantity exported. The bulk of the export goes to Singapore.

Various resins, known generally to the natives as *damar*, are collected by natives from the forest. By traders this name is applied only to the product of the *Hopea* and *Shorea* species of the *Dipterocarpaceae* family of resin-producing trees. The resin is sometimes found exuding from the tree-trunks, but resort is also made to tapping. Beyond this, little is known of the methods of collection. It is practised in the forests of Palembang and Sumatra West Coast. The more valuable varieties are designated white damar, glass damar, and cat's-eye damar, the quality from Sumatra being considered, because of its even colour, slightly superior to that obtained from Borneo. The industry is organized by Chinese and Arabs, who have establishments in Batavia for treating the commodity before export.

The Chinese also control the collection of rattan fibre, of which, in 1915, 1,894 tons were exported from Padang and 5,318 tons from Palembang. Large quantities are sold in the Singapore market.

Timber.—Native wood-cutting with an object beyond supplying domestic needs rarely exists, except in Palembang, where

in the eastern districts ebony and sandalwood are cut for local sale. Ironwood is sold to dealers. In Sumatra the timber of two trees, *Cassia florida* and *Sloetia Sideroxylon*, is known under this name. Complaint is made of the wasteful methods of native wood-cutters and their Chinese masters. For building materials, the natives of the inland districts largely depend on the forest, in which, subject to Government regulations and the local *adat*, they can fell timber for their personal needs.

Rubber.—Native rubber-growing for export is inconsiderable. There is a decrease in the cultivation of *Ficus elastica*, of which scattered plantations formerly existed in Benkulen, Tapanuli, Palembang, Acheh, and Sumatra East Coast. Gradually, with the encouragement of the Government, the growing of *Hevea* rubber is being substituted in Benkulen, the Lampongs, Riouw, Banka, and Billiton. In Palembang and Jambi the natives are said to show keenness in adopting the industry as an occupation for their spare time. *Hevea* planting is being extended also in Siak and in the Kuantan districts of Riouw. The decline in price, however, has operated to check expansion. The results of the experiment are not yet apparent, and export is insignificant.

Livestock.—Though sometimes slaughtered for food purposes, both oxen and buffaloes are used in Sumatra mainly as draught animals. The people of Sumatra West Coast are the chief flesh-eaters, and according to the statistics they possess the greatest number of both oxen and buffaloes. Acheh, in which an annual cattle-fair is held at Kuta Raja, is next on the list.

The few horses found in Sumatra do not belong to a native breed but to an imported stock. They are kept chiefly by the Bataks of Tapanuli and by the highland people of Sumatra West Coast. The Batak breed is small and only of use for ceremonial purposes. The horses of the Padang highlands are bigger, and are ridden by Europeans and native chiefs. From both places there is some export, chiefly to Sumatra East Coast.

In the Christian districts of Batakland there is a good deal of pig-keeping; on the island of Nias off the coast of Tapanuli, the pig is practically the only domestic animal.

Cattle-breeding in Sumatra, as elsewhere in the Outer Possessions, is carried on in a primitive way, the beasts not required for draught work being turned out into the fields under the care

of boys. There is no selective breeding, and diseases like the Batak pig plague spread unchecked. It is only recently that the Government has taken any steps, but in 1907 a school was opened for the training of native veterinary surgeons. The Government also supplies stallions for breeding purposes.

Fishing.—In addition to rice, fish is a common foodstuff, and is procured to a considerable extent by the natives both from rivers and from the seas. Trawling from *praus* and *sampans* is carried on all round the coasts ; in Siak the fishermen belong to a trade association. Where the native crew itself does not share out the catch in fixed proportions it generally falls to Chinese, who provide the working capital. Most of the small export trade in fish is in Chinese hands. The centre of the dried fish industry is at Bagan Si Api Api, in Sumatra East Coast, whence, in 1914, 19,000 tons of dried fish were exported. Shells, trepang, and a large quantity of *trasi*, or the condiment got from prawns, are also exported. Fishing as a means of livelihood is declining, and with it native boat-building, which was formerly of importance in Aceh. The natives of the coastal districts are now devoting their attention to more profitable commodities, such as copra. As yet, however, the import of dried fish is exceeded by the amount exported.

Mining.—Native mining is of little significance in Sumatra. In Sumatra West Coast a little gold-washing is carried on, and in the same region lead, tin, and mercury are also worked. Native tin-mining is of more importance in Indragiri and the Karimon Islands. In Palembang peat coal (about 1,000 tons in 1913) was produced for local use, while in 1914 about 900 tons of anthracite were exported from mines in the same residency. At the capital this coal fetched only 8s. to 9s. per ton.

European Enterprise in Sumatra and Adjacent Islands

To a much greater degree than any other island of the Outer Possessions Sumatra has proved suitable for the employment of capital on a large scale. Agricultural and mining enterprises, organized both by the Government and by companies of various nationalities, exist in many parts of the island, but there is also an extraordinary concentration in some districts of the residency of Sumatra East Coast, which makes it economically one

of the most important regions of all Netherlands India. Except in the case of rubber-growing it is not possible to indicate the relative extent of the interests of different countries.

Rubber.—Capital began to flow into the rubber-growing industry as a result of the 'boom' of 1909. According to the handbook of A. G. N. Swart, *Rubber Companies in the Netherlands East Indies, 1914*, there were in Sumatra, including Riouw and Dependencies, 102 companies with a total paid-up capital of nearly £10,000,000. Of these 49 were British with a paid-up capital of £5,000,000, 35 were Dutch with a capital of over £2,800,000, 14 French and Belgian with a capital of nearly 1½ millions, 3 American with a capital of over £1,400,000, and 1 German with a capital of over £21,000.

The chief plantations are in the districts of Deli and Serdang, Langkat, Asahan, and Simulangan and Karolands in Sumatra East Coast, in which residency, in 1914, there were 205,615 acres planted with rubber alone and 45,234 acres of rubber with various catch-crops, principally coffee and coco-nuts. In Riouw and Dependencies there were 12,737 acres planted with rubber alone, and 7,981 acres with rubber and other crops. Acheh had an acreage of 9,500 acres with rubber alone and 4,440 acres of rubber and other crops, and Tapanuli 8,250 acres with rubber and only a small area under mixed cultivation. In the Lampongs, on the other hand, an area of about 12,000 acres was almost entirely devoted to the mixed cultivation. Various experiments have resulted in the almost universal adoption for culture on this scale of the *Hevea* tree, although there is still a small acreage devoted to *Ficus elastica* and other varieties.

The labour necessary for the plantations in Sumatra East Coast is supplied largely by the importation of coolies, chiefly Chinese. The Government tried using Achinese on its plantation in Langra, but they proved unsuitable. The cost of production of 1 lb. of dry rubber from a plantation of 1,700 acres has been estimated at about 1s. As most of the companies did not begin exploitation until 1910 the trees will not produce to their fullest extent until about 1920, when it is expected that 1 acre will produce 375 lb. of rubber. In 1915, 9,178 tons of *Hevea* and 425 tons of *Ficus* were exported from Sumatra East Coast, as against 4,760 tons of *Hevea* and 382 tons of *Ficus* for 1914. In 1915 Tapanuli exported 515 tons of *Hevea*, but no

Ficus, as against 322 tons of *Hevea* and 41 tons of *Ficus* in 1914. The total export from Sumatra in 1915 was 10,125 tons of *Hevea* and 444 tons of *Ficus*. The great increase over the production in 1914 was due to the increasing number of trees ready for cutting for the first time.

Tobacco.—In the course of the last fifty years Sumatra has become celebrated for the production of leaf-tobacco, which is grown exclusively on European plantations. The special quality produced has taken its name (Deli leaf) from the region in which it is to a large extent grown. In 1914 there were 84 estates in Deli and Serdang which produced 228,560 pikols; 35 estates in Langkat which produced 103,234 pikols; 2 estates in Asahan which produced 6,593 pikols, and 2 estates in Simulungan and Karolands which produced 4,103 pikols.¹ About a third of these estates were devoted to other cultures also, chiefly rubber and also tobacco. It is estimated that about £12,000,000 of capital is invested in the tobacco culture in Sumatra and that the annual export amounts to over £5,000,000 in value. The bulk of the product goes direct to Holland and is sold at Amsterdam and, to a lesser degree, at Rotterdam.

Coffee.—The rubber 'boom' diverted much capital from coffee-growing, which had always been a precarious enterprise, and at present it exists mainly in conjunction with other cultures. In 1913 there were only 2 estates in Sumatra East Coast devoted to the exclusive cultivation of coffee, against 67 for coffee and other cultures. In Sumatra West Coast, the original home of coffee cultivation, where the estates are smaller, the two forms of cultivation were about equal in number, while in the Lampongs coffee was only cultivated in conjunction with rubber or coco-nuts.

The prospects of coffee cultivation are said to be more promising as a result of the substitution of the hardy *Robusta* plant for the native Java, and the Liberia, which succumbs easily to plant diseases. The change began in 1909 and now practically no new planting of Liberia is being carried out. In Sumatra especially the change is being rapidly effected, and now the area planted with Liberia is less than one-sixth that planted with *Robusta*. A review of the situation as it was in June 1914 showed that in Sumatra East Coast, on the mixed culture estates 38,054 acres were planted with *Robusta* against

¹ These figures indicate a total production of about 20,800 tons.

7,673 acres of Liberia and 500 acres of Java coffee. Exclusive plantation of *Robusta* extended to 5,030 against 2,320 acres of Liberia alone, and none at all of Java coffee. The total acreage under coffee for the other provinces was as follows : 5,510 acres in Sumatra West Coast, 1,775 acres in Tapanuli, 1,613 acres in Benkulen, 11,200 acres in the Lampongs, 2,796 acres in Palembang, and 5,332 acres in Aceh. Of the total acreage five-sixths were devoted to *Robusta* and the bulk of the remainder to Java coffee. In 1914 the greatest production occurred in the residency of Sumatra East Coast, where 45,766 pikols were harvested. Next in amount was the Lampongs province with 22,425 pikols ; 10,450 pikols were produced in Palembang, 5,190 pikols in Sumatra West Coast, 9,000 pikols from Benkulen, and 741 pikols from Tapanuli. These figures indicate a total production of about 5,600 tons.

Copra.—An industry which of late years has begun to attract not only the efforts of natives living in the coastal districts, but also the attention of Europeans and others able to furnish capital for industry on a large scale, is coco-nut planting. Along the east coast of Sumatra the trees are grown in conjunction with coffee, rubber, and tobacco on the big plantations. On the smaller estates of western Sumatra they are often grown alone and sometimes with coffee, *Hevea* rubber, rice, or sugar-cane. In Aceh there are 37 estates for coco-nuts alone, many of which are owned by Chinamen. Export figures for the copra industry as a whole have already been given.

Tea, Cinchona, &c.—Tea plantations exist in Benkulen, Sumatra West Coast, and Sumatra East Coast, where there are seven estates, but the production is as yet unimportant. In Sumatra West Coast there is a small cultivation of cinchona. European capital is also interested to some extent in the exploitation of forests, and there are numerous concessions for timber-felling and the collection of forest products, including wild rubber and gutta-percha.

Tin.—Sumatra possesses large deposits of tin, coal, and petroleum. Twenty per cent. of the world's output of tin comes from Netherlands India, where it is found on the islands of Banka, Billiton, and Singkep, adjacent to Sumatra, and on the mainland. Tin has been exploited under European supervision in Banka for a century. The industry in Banka is now in the hands of the State ; in Billiton it is worked by the

Billiton Company with a concession from the Government, and in Singkep by the Singkep Company with a concession from the Sultan of Lingga and a grant from the Government of the working of the 'sea tin' under territorial waters.

In Banka the tin ore is found in alluvial deposits. Vein ores exist but are not worked. The percentage of ore is generally about 2 to 4 per cent. of the ore stratum, but in some places as much as 10 per cent. The grain of the ore varies in size from pebbles as big as a man's fist to fine powder. Most of the mines, some with a depth of 80 ft., occur on the northern and eastern sides of the island. The mines are worked almost exclusively by Chinese coolies, who number about 20,000. These work in communities, or *kongsis*, subject to regulations and technical supervision. The total production for the working year 1914-15 was about 14,500 tons, as against nearly 15,000 tons for the working year 1913-14. The cost price of 1 pikol (about 136 lb.) in the warehouses in Banka was fl. 41.20. The whole product is sent to Holland for sale at Amsterdam and in the year 1914-15 the net profit per pikol was fl. 119.34, but it was fl. 146.24 in 1913-14.

The Billiton Company, with a capital of £416,000, first obtained its concession in 1852 and this was renewed in 1892. Five-eighths of the profits go to the Government. The form of the deposit is much the same as in Banka except that there are several veins rich enough to be worked. Chinese coolie labour is employed. During the year 1914-15 from 7,400 tons of ore, smelted partly at Singapore and partly at Lepat Kajang, 5,214 tons of tin were obtained. The product is sold both at Singapore and Batavia. The profit for the year 1912-13 was £258,400, of which the Government received £161,580. In the preceding ten years the share of the State amounted to £1,770,250.

The Singkep Company, with a capital of £125,000, first secured, in 1887, from the Sultan of Lingga, a concession of 100,200 acres and in 1907 a concession from the Government to work the 'sea tin'. Four per cent. of the gross profit on the sea tin goes to the State. The working of the large deposits is carried out as in Banka and Billiton; smaller deposits are worked by means of 'adits' in the hill-sides. The sea tin is obtained by dredging. The company was for some time working at a loss, but since the sea tin has begun to be worked

prospects are said to have improved. In the year 1914-15 867 tons of tin were produced, of which amount 483 tons were obtained from the sea-bottom. The product was sold at Singapore at a profit of £58,820.

Coal was discovered in Padang in 1868 and mining was begun in 1892. The mines in this region are worked by the Government. The Ombilin coal-field in Padang, which lies along both sides of the Ombilin River and comprises an area of 15,000 acres, was estimated in 1875 to contain 200,000,000 metric tons of Eocene coal. The present mining activity is confined to the Sungei Durian field, which is estimated to contain 93,000,000 tons. The thickness of the seams varies, some being as much as 75 ft. The composition of the product is given approximately as 77 per cent. carbon, 6 per cent. hydrogen, 13 per cent. oxygen and nitrogen, 4 per cent. moisture, 0.35 to 0.6 per cent. sulphur, 0.7 per cent. ash, and 1 per cent. resin. The method of working is solely by adits. The mining is done by contract coolies (1,445 in 1914) and by forced labour (3,323 natives in 1914). A railway connects the fields with Emmahaven. In 1914, 354,856 tons of mixed coal, 63,225 tons of dust, 25,024 tons of fine coal, and 35 tons of briquets—in all 443,140 tons—were produced in the Ombilin field, as against 411,017 tons in 1913. Originally the coal was used entirely by the Government, but in 1913 its consumption was only 82,000 tons, against 314,000 tons used by private customers, chiefly the Dutch steamship companies and the Acheh Tramway. It is not used by the Dutch Navy. The sale of coal is said to suffer from lack of means of transport and the necessity of burning it in special furnaces.

Outside the Government mines there are in Sumatra West Coast, Benkulen, Sumatra East Coast, and Indragiri, several small concessions with no production worthy of mention. German and Japanese offers are reported (1918) to have been made for the Bukit Sunur concession, 18 miles from Benkulen. In Palembang there are six concessions comprising 8,000 acres belonging to the Sematang Exploration Company. Hopes are entertained of the recently-exploited Sematang district. It is reported (1918) that every transition from brown coal to anthracite and graphite is found here, and that the anthracite has been proved satisfactory in the furnaces of warships. The production is limited to 4,000 tons a month by the low

carrying capacity of the Tanjong-Muara Enim railway, but a metre-gauge railway will enable 20,000 tons a month to be carried. It is intended to build such a line to Palembang and to erect a coal-tip for sea-going vessels there; also to establish an electric power plant and briquetting and coking factory at Muara Enim.

Petroleum.—The most important mineral of Sumatra is petroleum, which is found chiefly in Langkat and Perlak in the north, and in Palembang, but also in Sumatra West Coast, Nias, Indragiri, and Jambi. The crude oil obtained in Sumatra contains a great deal of benzine but little paraffin. The benzine is very light, and after distillation is so pure as to make treatment by sulphuric acid unnecessary. The best kerosene produced in Netherlands India also comes from Sumatra.

The petroleum industry all over Netherlands India is controlled by the Royal Dutch Company and the Shell Transport Company, which jointly established two other companies—the Bataafsche (Batavian) Petroleum Company at the Hague and the Anglo-Saxon Company of London. The shares of these two are held by the first-named concerns in the proportion of 3 to 2. The Batavian Company manages mines and refineries, the Anglo-Saxon the transport, while a third company, the Asiatic Petroleum Company of London, carries out the sales.

The establishments of the combine in Sumatra are as follows :

(a) The Muara-Enim Company founded at Amsterdam in 1897 with three concessions in South Palembang, Muara Enim, Babat and Banjarsari, and a large refinery at Plaju near the town of Palembang.

(b) The Musi-Iilir Company, founded at Amsterdam in 1901, with two concessions in Middle Palembang, one of which has been returned to the Government as unprofitable. The Royal Dutch in 1906 contracted to work its oil and refine it at Bagus Kuning, and gradually acquired all the shares.

(c) The Sumatra-Palembang Company, founded at the Hague in 1897, with a concession in North Palembang which, with its refinery at Bayung Lintyir, was bought by the Royal Dutch in 1907.

(d) The Mine, Wood, and Agriculture Exploitation Company, founded in 1894 by the Shanghai Langkat Company of

Tanjong Pura, with a concession at Bulu Telung in Langkat, a refinery at Rantau Panjang, and establishments in Pulu Sembilang Island and elsewhere, acquired in 1910 by the Batavian Petroleum Company.

Besides these acquired establishments there are the original undertakings of the Royal Dutch, which include the productive Telaja Said concession, with a refinery at Pangkalan Brandan, another on the Besitang River in the Bukit Mas concession, and a shipping station at Pangkalan Susu on Aru Bay, connected by pipe-line with Pangkalan Brandan. Moreover, there are subsequent undertakings begun in Perlak in South Aceh in 1901 and the works of the South Perlak Company, which since 1907 has sold its oil to the Royal Dutch.

In the various South Sumatran concessions, which in 1914 were thirteen in number, 216,451 tons of crude oil were obtained, and of this amount the Muara-Enim concession produced 99,905, the Suban Jerigi 44,814, and Babat 22,813 tons. In Sumatra East Coast the concessions yielded 105,448 tons of crude oil, of which the Bulu Telung concession produced 96,824 tons. From the total amount of crude oil, 56,082 tons of petroleum and 30,302 tons of benzine were obtained. In Aceh the Batavia Company produced 1,361 tons, the Perlak Company 135,709 tons, and the South Perlak Company 11,433 tons of crude oil. In Palembang there has been a decline in production since 1909, when the output of crude oil reached over 350,000 tons. The output in Aceh, which in 1909 was almost as great, shows a still more marked falling off, producing in 1914 only 148,503 tons. Sumatra East Coast, which in 1909 slightly exceeded 200,000 tons, fell by over 100,000 tons in 1911, recovered in 1912, and in 1914 fell to 105,448 tons. The production of the Sumatran fields generally in 1916 showed a moderate increase.

Precious Metals.—Of minor importance is the exploitation of gold and silver, for which concessions have been granted in Aceh, Tapanuli, Sumatra West Coast, and Benkulen. In 1914 in Benkulen three concessions produced about 2 tons of gold and nearly 10 tons of silver. The Government in 1913 was investigating Tambang Sawah in Benkulen.

BORNEO

In Borneo there are two grades of native agriculture, that practised by the Dayaks of the interior and that in vogue among the peoples of alien origin (Malays, Javanese, Buginese, Chinese, and others) inhabiting the coastal districts and the basins of the chief rivers.

Dayak Production

Rice cultivation among the Dayaks is on much the same level as in central Sumatra, and from its wasteful methods is described by the Dutch as *roofbouw*. *Ladangs* are formed by burning clearings in the forest, and the ground thus cleared receives no further preparation. The plough is unknown except to the Dusun Dayaks in North Borneo. The season of sowing is fixed in arbitrary fashion by consulting the stars and by similar means, while the harvest is celebrated by feasts and dances. Land is used only once in about three years and after twelve or fifteen years it is necessary to resort to virgin ground. If this is not obtainable in the vicinity, the whole community is compelled to remove. The Government is doing its best to induce the natives to adopt *sawah* culture, but only with effect in Landak and Mampawa.

Other Crops.—The agricultural Dayaks raise other crops, but to a less extent. These are maize, sugar-cane, tobacco, and potatoes. Tobacco is only of importance in the highland districts of Ulu Sungei and Upper Dusun, where it is grown for domestic consumption chiefly, with a little for the native market. In 1913 export from the whole Residency of South and East Borneo for the native market amounted to 59 tons.

Production by Coast Peoples of Borneo

Rice.—The coast peoples vary in agricultural efficiency. In many districts rice cultivation is carried on in the same unsatisfactory way as among the Dayaks. Some of the coast people of South and East Borneo, who are of mixed Malay and Javanese origin) are more capable than the pure Malay, while the Chinese colonists of West Borneo are more efficient still. In both localities *sawah* culture is the rule. The returns available for 1914 refer only to 6,160 acres, in West Borneo, situated in the Ketapang division. Reference is also made to export on

a large scale from the district of Pamangkat in the Sambas division. The export of the whole Residency in 1913 was 450 tons as against an import of over 15,600 tons, of which the bulk came from Singapore and the remainder from Java. In the South and East Residency rice culture is more extensive and productive, chiefly round the mouths of the rivers. Returns of 1914 record 13,273 acres of *sawah* irrigated by running water, 43,063 acres dependent on rain, and 3,069 acres of marsh *sawah*. There was also reference to 12,776 acres of *ladang*, most of which were cultivated irregularly. Production in Banjermasin and Ulu Sungei is stated to have suffered as a result of drought. The harvest in 1914 in the first-named district amounted to 584,864 pikols, against 1,416,800 pikols of 1913; in the second district the harvest in 1914 was 1,493,705 pikols against 1,704,902 pikols in 1913. In 1913 there was a small export of 180 tons, but 27,500 tons were imported during the same year.

Copra.—All round the coasts, especially in the Residency of West Borneo, the growing of coco-nuts and the preparation of copra is increasingly practised by the Malays and Chinese. A vast quantity is produced in the Kapuas delta, and Pontianak is the market for the copra of Sukedana, Simpang, and other coastal districts. The trade and, to a considerable extent, the industry are in Chinese hands. From the whole Residency in 1913 there was a total export of 28,000 tons, most of which went directly abroad. Nearly the same amount was exported in 1914, but in 1915 there was a falling-off in the export from Pontianak. In the Residency of South and East Borneo the culture is also extending, particularly in the districts of Ulu Sungei and Samarinda.

For many years copra oil has been manufactured at Pontianak, apparently for domestic consumption only; the extract from the fresh fruit is exported.

Sago.—Chinese and Malays in Sambas and the Kapuas delta cultivate sago, of which 1,283 tons were exported in 1914 from West Borneo.

Pepper.—In districts of both residencies of Borneo both the black and white varieties of pepper are produced. In West Borneo the crop is raised by the Dayaks and Chinese of Singkawang, Lara Lumar, Buduk, and Seminis districts of Sambas. In South and East Borneo it is grown in Pagatan and Kusan,

and also in Pulu Laut. The prevalent culture is white pepper, of which, in 1914, 694 tons were exported from West Borneo and 373 tons from South and East Borneo, against an export of black pepper of 69 tons and 318 tons respectively.

Gambir.—In the Singkawang, Buduk, and Siminis districts of Sambas the Chinese are also engaged in the preparation of gambir, which is consumed locally as a rule, although there is occasional export.

Rubber.—Native rubber plantations exist in Sambas, since 1914 in Mandor and along the Little Kapuas, and in the divisions of Ulu Sungei, Banjarmasin, Dusun, and Kuala-Kapuas in South and East Borneo. In the Tanjong district of Ulu Sungei the trees in 1914 numbered 450,000, but few of these are ready for tapping. Of these also 11,000 were destroyed by *alang-alang* fires. So far export has not been of great importance. From West Borneo the export consists chiefly of *Ficus* rubber, which in 1915 amounted to 312 tons. In South and East Borneo *Hevea* is of more importance, and in 1915 400 tons were exported. The recent plantations in Mandor and along the Little Kapuas in West Borneo are of *Hevea*.

Pinang.—As everywhere else in Netherlands India the *pinang* palm is grown extensively, and the export of betel-nut from West Borneo in 1914 amounted to 2,881 tons. In the district of Riam Kanan in Banjarmasin *sirih* is grown.

Forest Products.—An important means of subsistence for both economic classes in Borneo is the collection and disposal of the various forest products. These include wild sago as a foodstuff for Dayaks in times of rice shortage, and for trade purposes rattan, damar, *jelutong*, camphor, and wild honey. The rattans from South and East Borneo are of an inferior kind and are exported only to other provinces of Netherlands India and to China. The export in 1914 from West Borneo was valued at £10,798. Bornese damar is slightly inferior to that of Sumatra. A product of the same tree as that from which damar is produced is *tengkawang*, or Borneo tallow. The chief export is from Pontianak where there are mills for treating the nuts. Besides Dayaks, bands of Malay adventurers are engaged in the collection of forest products. They make expeditions into the interior, returning to the nearest Malay settlement where they dispose of their produce to Chinese traders.

Fish.—From the residency of South and East Borneo there

is a considerable export of dried and salted fish. Both Malays and Chinese are engaged in the industry.

Mining.—Native mining in Borneo is of some account. In West Borneo gold washing is carried on in several places by Chinese. The chief production is in Sambas, Sanggau, and Landak. In the Landak River in 1914 diamonds to the value of £416 were obtained. In the Embau and Salembau district and in the districts of Upper and Lower Bunut a small quantity of coal is mined. In South and East Borneo native mining is more important. In the Martapura and Pleihari districts there are diamond diggings from which stones to the value of £4,060 were obtained in 1914. The product of the native gold undertakings was valued in 1914 at £430. In the same residency there are several native coal mines, of which the anthracite diggings at Parapatan in Kutei are the most important. In 1914 these mines produced 12,945 tons of coal. Other coal-producing districts are Riam Kiwa, Riam Kanan, Dusun, and Samarinda.

European Enterprise in Borneo

Agricultural undertakings on a great scale are not as yet numerous, and Dutch writers refer to a disinclination to invest capital in Borneo. This is true in particular of West Borneo, which, about 1889, was overrun by gold and land speculators whose enterprises came to nothing, with the result that the region got a bad reputation.

Land in government territory is leased in *erfpacht*, while in the territories of independent princes concessions, of which the Dutch Government must first approve, are obtained. Besides European planters the lessors are also Chinese, and Arab and native priests. Of *erfpacht* leasehold properties there is a large number in the Banjermasin division of South and East Borneo, on which chiefly rubber and coco-nuts, and also Liberia coffee and rattan are grown. Only one is reported in West Borneo, on which the Catholic Mission grows rubber. But in West Borneo there are a good many concessions in Sambas, Pontianak, and Sanggau where rubber and coco-nuts are produced. Concessions in South and East Borneo are nearly all in Kutei, where Liberia coffee, rubber, and coco-nuts are grown. Many of these concessions, however, are not worked.

Rubber.—Rubber-growing on a large scale has only recently

begun in Borneo. The acreage planted in West Borneo in June 1914 was 3,500 acres and on this area *Hevea* alone was produced. Of 4,980 acres of rubber plantations in South and East Borneo 2,890 acres are planted with *Hevea* and 2,086 acres with *Ficus*. Of eight rubber companies in Dutch Borneo six were British with a paid-up capital of £600,000 and two Dutch with a paid-up capital of £225,000.

Petroleum.—In 1913 Borneo yielded about half the petroleum production of Netherlands India. The chief producing districts are Tarakan Island at the mouth of the Sesayap River and the region of the Mahakkan delta. The working of the wells is in the hands of the Batavia Petroleum Company, and in 1914, 866,718 tons of crude oil were produced, which represented an increase of nearly 100,000 tons over the production of 1913. A further increase was recorded down to 1916.

Bornese crude oil varies considerably in composition. At different depths in the same field at Sanga-Sanga are found oils of the following kinds: (1) Heavy crude oil with a specific gravity of 0.95 containing no benzine or kerosene and no paraffin. (2) Oils of a specific gravity of 0.85 yielding up to 18 per cent. of benzine and more than 50 per cent. of kerosene, but no paraffin. (3) Oils of a specific gravity of 0.85 containing up to 15 per cent. of benzine, more than 45 per cent. of kerosene, and from 8 to 13 per cent. of paraffin. The heavy oil of Tarakan Island, after a simple preparation, yields excellent fuel for Diesel motors. Bornese benzine requires no refining. At Balikpapan there is a large factory for obtaining the best kerosene. The paraffin refinery here is one of the largest and best equipped in the world. Roughly speaking, two kinds of paraffin wax are produced, a soft wax with a melting point of 125° to 130° F., and a hard quality with a melting point of 135° to 140° F. Bornese oil contains many paraffins which can be separated when there is any demand. At Balikpapan also there is a factory which manufactures candles for export, and a factory for making sufficient sulphuric acid to supply all the refineries of Netherlands India. The oil is brought from Sanga-Sanga to Balikpapan by a pipeline 65 miles in length.

Coal and Iron.—Next in importance to petroleum is coal. The principal enterprise is on the island of Pulu Laut off the south-east point of Borneo, where mines, once worked by a company,

were taken over by the Government in 1913. Before that year the mines had rarely been worked at a profit and generally at considerable loss. It is hoped that in the future they will be worked with greater success and even attain a production equal to that of the Ombilin mines in Sumatra. In 1914 the production was 128,505 tons, of which 110,383 tons were large coal and 18,122 tons were dust. This represents a slight falling-off compared with previous production. The chief private coal-mining enterprise consists of concessions by the Sultan of Kutei to the East Borneo Company, which by its own mining and by the purchase of the native product obtained 16,808 tons in 1914, against 8,643 tons in 1913. It is stated (1918) that a company has been formed in Singapore to acquire concession rights in Sebuku Island to work coal, iron, and timber. Coal has been proved, and a superficial bed of soft limonite occurs, mostly along the shore. Such a development of coal and iron together might have an effect upon the industry of Singapore, and lead to the development of ship-building and engineering there.

Although there are concessions to Europeans for working other minerals little or no exploitation has taken place.

CELEBES

As in the majority of the islands of the Outer Possessions, two fairly distinct economic societies at least can be recognized—that of the natives of the interior and that of the natives inhabiting the coastal districts. The distinction is between the tribes collectively termed Torajas, which inhabit Middle Celebes and the south-eastern peninsula, and the Buginese, Makassarese, Mundarese, Gorontalese, and Minahasese who preponderate in the north and south-west of the island.

Production by Torajas

Rice.—The Torajas of Middle Celebes are naturally the less developed. Originally cultivation was everywhere on *ladangs* cleared in the forest. Rice was raised the first year and in the following year maize, vegetables, sugar-cane, and tobacco for domestic consumption. Their chief food crop, rice, was very uncertain in consequence of the method of cultivation, and additional supplies were obtained from the coast by bartering

forest products—rattan, damar, wax, hides, and deer horns. Cloth, knives, and trinkets were also accepted by them, and by this means the natives, among whom communism was practised in an extreme form, were enabled to acquire private property. Since 1892 the Government, with the object of encouraging the Torajas to adopt a more settled mode of life, has brought them down from the mountains to live in villages near a supply of running water, as already described in Chap. VII. *Sawah* culture, which was not unknown in Middle Celebes, having been practised by the natives of Kulawi Valley and elsewhere, was, where possible, now made compulsory. Restrictions have been placed upon expeditions into the forest, so that male labour will be available for agriculture. The Chinese and other traders who fit out the expeditions for collecting forest products are confined to fixed villages from which to recruit workers. The best and largest *sawahs* are situated on the shores of Lake Poso. To the south, stretching along the north shore of the Gulf of Boni is the Masamba plain, which has been called the rice granary of Middle Celebes.

Forest Products.—Celebes is by far the most important exporter of forest products. The Torajas range through the forests in the region of the great lakes, and the products are carried overland or by river praus to the coastal settlements, where they are bartered to Buginese and Chinese traders for rice. This trade is specially active in the Gulf of Tomini, which is visited at regular intervals by the steamers of the Koninklijke Paketvaart Maatschappij from Makassar. Before the war the North German Lloyd also ran a service for the same purpose.

Copal (both the hard and soft varieties) is exported from Makassar, in 1914 to the value of £47,160. In 1914 the value of the damar exported from Makassar was £45,830, and from Menado £36,580; the rattan from these two ports was valued at £76,160 and £50,080 respectively. The hides and horns of cattle and deer, procured from the Torajas, are also exported in considerable quantities from Makassar. Although the interior of Celebes is thickly wooded, little has been done, beyond investigation, towards the exploitation of the timber. Teak is found in small quantities in the island of Muna.

Production by Coast Peoples

Rice.—The agriculture of the various coastal peoples is in a more advanced condition than that of the Torajas. In the Menado Residency there were, in 1914, 32,324 acres of rice *sawahs* irrigated by running water, 4,317 acres dependent on rain and a small acreage of marsh *sawah*. Reference is also made to 72,834 acres of *ladangs*, some of which were not in regular cultivation. The culture is developed most highly among the Minahasese at the eastern end of the north-eastern peninsula. Among the Buginese peoples of southern Celebes rice is also largely cultivated, and the districts of Maros, Pankajene, Soppeng, and Sidereng, all in the south-west, are mentioned as regions producing more rice than is necessary for their own consumption. From the Government of Celebes and Dependencies a considerable but varying amount is annually exported, and sometimes a little from Menado. Both provinces depend on a huge amount imported every year.

Maize.—In the south-west of Celebes maize is almost as important as rice. In Turateya, Kajang, Saleier Island, Boni, Wajo, Mandar, and Kaili Luwu it is the chief foodstuff of the natives, by whom it is cultivated as a first crop. It is grown extensively on the shores of Lake Tempe when, during the east monsoon, the lake is partially dried up. The export from the government of Celebes and Dependencies steadily increased in the years 1913, 1914, and 1915, in the last year of which the export amounted to 33,977 tons. Export was mainly to the Netherlands, although Australia took 3,000 tons. Commodities produced purely for trade purposes are copra and coffee.

Copra is the chief trade product of Celebes. Coco-nut trees are grown all round the coasts of the north; of more recent development is the extension of the culture among the Buginese in the south. The Chinese trade in Bonthain is important. The natives of Saleier Island are extensively engaged in coco-nut growing and the preparation of copra. The value of the export is more than twice that of all other commodities together. It is exported in equal quantities from each of the two provinces.

Coffee.—The principal coffee-growing was at one time on the plantations of the Government in Minahasa, but now is chiefly in native hands. It is cultivated with good results only in a

few districts. In the Latinojong hill districts the Duri variety of Java coffee is grown in small quantities; 'coffee pacho Bonthain' is another variety of Java coffee which is cultivated at a profit. In Gowa, where the ground in the hill districts is suitable, the culture has not yet entirely vanished, but is dwindling. The best coffee is got from Pao. As far as Eure, Bulu Tanah, and Kindung are concerned it is said that the causes of the failing culture are the greed of the princes, who hurry the harvest, the crude method of gathering the fruit, and the general lack of care. If these conditions continue coffee cultivation in South Celebes will eventually disappear. The Government is doing what it can to avert this, and at Sanggai large nurseries of the *Robusta* plant have been laid out. The young plants are sold to the natives at a small cost and the effect is stated to be that the natives display a revived interest in coffee-growing. In 1914 27,080 pikols of coffee were exported from Celebes and Dependencies, and 2,645 pikols from Menado.

Manila hemp, which was of importance in Minahasa, is finer and whiter than European flax. The natives, however, have not sufficient skill or diligence to work the industry at a profit, so that the Netherlands Trading Company has given up its branch at Menado. On the islands of Sangi and Talaut the culture is in native hands but practically only for domestic consumption.

Kapok.—Celebes is the chief producer among the Outer Possessions of kapok fibre, the kapok being grown almost entirely on the haphazard plantations of the natives. Of late years, however, there has been a tendency in South Celebes to cultivate the plant in a more regular way. From Makassar in 1914 1,220 tons were exported. The kapok seeds, which are thus available in large quantities, are treated in a large European factory established in 1913 at Makassar (Manders Seemann & Co.) for the purpose of extracting oil.

Cotton.—Experiments in cotton cultivation are being tried in Middle Celebes.

Nutmegs, Mace, and Cloves.—Nutmeg cultivation in Menado (chiefly in Siau, Sangi Islands and Minahasa) is still considerable, and in 1914 10,428 pikols of nutmeg and 2,032 pikols of mace were exported. From Celebes and Dependencies also the export was not unimportant. This culture, however, is everywhere giving way to coco-nut growing.

Fishing.—The Orang Bajo and the Buginese of South Celebes—especially the latter—are celebrated throughout the archipelago as seafarers and fishermen. Fishing fleets from Makassar sail to the Moluccas and as far as the north coast of New Guinea to obtain *trepang*. Fishing for turtles and mother-of-pearl is also carried on off the east coast of Celebes. This industry is, to some extent, directed by Arabs belonging to Amboina. ●

Mining.—Native exploitation of metals is insignificant. For many years a small quantity of gold, washed by the natives in the north, has been exported from Menado. Other minerals found in small quantities are iron, copper, lead, and nickel ; in South Celebes a little coal has been found.

European Enterprise in Celebes

European enterprise on a large scale has so far made little headway in Celebes. In Menado there are some concessions devoted chiefly to coffee and coco-nuts. There is official reference to only seven estates, which in 1914 produced a small quantity of coffee (2,125 pikols). In the same residency there are numerous small estates (largely owned, however, by Chinamen), growing coco-nuts and nutmegs. There are a few forest concessions, in Celebes and Dependencies for timber of all kinds, and in Menado for ebony.

It is reported (August, 1918) that the erection of coco-nut oil mills in Makassar is being undertaken by two Dutch concerns ; also that speculators (including German traders) were holding there about 90,000 tons of copra for shipment after the war.

In Menado also there are eight concessions to Europeans to exploit gold. Four of these, Totok, Paleleh, Pagnat, and Bolaang Mongondom, the two first being the most important, produce jointly the greater part of the gold and nearly all the silver obtained from all Netherlands India. In 1913 the Government was investigating the Sasak district with a view to obtaining gold.

The government has also recently investigated the country near Usu Bay at the north-east corner of the Gulf of Boni, where a commission reports (1917) the discovery of nickel ores in paying quantity, and also very large deposits of excellent iron ore, notably near Larona. Here power would be available from the Malili river, but the difficulties of

development and transport are considerable : the construction of a railway to Usu Bay and the provision of shipping facilities there would be involved, while the scanty population of the district renders difficult the question of labour. It is stated, however, that the possibilities of this district have been found worthy of close consideration.

MOLUCCAS AND NEW GUINEA

Native Production

Sago.—The low standard of native agriculture in the Moluccas is due to the prevalence of the sago palm, the pith of which is the staple food of the natives everywhere except in the Uliassers. When under cultivation the tree requires only little attention ; generally it grows wild. The product of one tree will suffice to maintain a family of average size for two or three months. Certain islands where the population is scanty and the sago tree abundant, furnish supplies to the more densely populated islands. Thus Haruku, Saparua, Nusa Laut, and also Amboina are supplied from Ceram, and Ternate, Tidore, and Bachian from the Obi Islands and Halmaheira. In both cases it is necessary for the natives to make expeditions to secure their own supplies.

Agriculture for the production of foodstuffs is little practised, and in undeveloped islands like Ceram it is quite a subsidiary activity.

Rice on dry fields is cultivated on various islands, such as Ternate, Bachian, in a few districts of Halmaheira, and by the Binangkorese coolies in Amboina. In 1913 there was a small export of 70 tons from the residency of Ternate and 176 tons from the Amboina residency.

Maize is grown chiefly in Haruku, millet in Buru.

Vegetables and fruits of many kinds serve to eke out sago in the diet of the natives.

Nutmegs, Mace, and Cloves.—The chief contribution by the Moluccas to the world market consists of spices, chiefly nutmeg, mace, and cloves. Except in the Banda group, this culture is in native hands, and with the present condition of the market only native cultivation on a small scale pays its way. Nutmeg culture of this kind exists all over the Moluccas, and though the product is as a rule inferior to that produced under European

supervision, in some cases, as in Halmaheira, the nuts are classed for trade purposes with those grown on the plantations of Banda. In Ternate, once the home of the European industry, the nutmeg is now cultivated with the assistance of coolies from the Talaut Islands. In the thickly wooded islands the wild nutmeg is found, as in Halmaheira, Bachian, Obi, Ceram, and New Guinea. The mace yielded by the wild nutmeg of New Guinea is described as an excellent spice, and it is marketed separately at Makassar.

The growing of cloves is less widely distributed, and a regulated culture exists only in Amboina, and is for the natives of this island and those of the neighbouring Uliassers an extra source of income. The culture, however, is diminishing, although it is said that despite the low prices obtained, a profit would be possible if the necessary labour were available. Export figures for nutmeg, mace, and cloves are given below in connexion with the European cultivation of spices.

Copra.—Spice culture by natives has to some extent yielded ground to what is at present a much more profitable and less laborious occupation—that of growing coco-nuts for copra. Everywhere in the Moluccas the growing of coco-nuts is being practised with the encouragement of the Government, and even the natives of Ceram and New Guinea are being induced more and more to take up the culture. In 1913 the Amboina Residency exported 3,484 tons of copra, and Ternate 2,694 tons.

Forest Products.—Of great importance in the Moluccas and New Guinea is the collection for export of forest products, which include resins, rattan, cajeput oil, various kinds of timber, hides and horns, and the skins of birds.

Moluccas damar, which has a special reputation in the market, is similar to the Borneo variety. It is collected on several islands, generally by the inhabitants of the interior of Ceram, Halmaheira, Bachian, Sula, and Obi. In Bachian the collection of damar is supervised by a European company which manufactures and exports quantities of damar candles. The export from West Ceram is also considerable.

Cajeput oil is obtained chiefly in Buru and also in Ceram. It is obtained by distillation from the leaves of *Melaleuca Cajeputi*, which grows mostly in a wild state. Kayeli and other villages along the north coast are almost all engaged in the

preparation of this commodity. The industry is organized by Chinese and Sulanese.

Ironwood (*Nania vera*), which is found chiefly in the Kei Islands, is also obtained from the forests of Ceram, Halmaheira, and its thickly wooded neighbouring islands. Ebony is also obtained. The hides and horns of deer are exported from Halmaheira, while the skins of the bird of paradise form as yet the chief commodity exported from New Guinea.

European Enterprise in the Moluccas and New Guinea

Nutmegs, Mace, and Cloves.—Individual European enterprise in nutmeg production succeeded the old system of compulsory cultivation which had existed for two and a half centuries under the Dutch East India Company and later the colonial administration. Up to 1894 prices were high and the planters of Banda made huge profits. From that date, however, as a result of competition, prices dropped, and many of the planters were ruined. Banda, once the home of so much wealth, became poverty-stricken. Most of the plantations have been acquired by the Banda Trade and Credit Association, and it is thought that the concentration of the industry in the hands of one concern will make for economy. In 1913 there were thirty-one plantations in Lontor and three in Banda Neira. There are a few also on Run, Ai, and Rozengain. In 1914 the total export from the Amboina Residency, both European and native, was 15,115 pikols of nutmeg and 3,806 pikols of mace. Most of the product was exported without preliminary treatment. In the same year Ternate exported 1,692 pikols of nuts and 243 pikols of mace, being the produce of native growing and exported without preparation. The export of cloves from the Uliassers and Amboina was in 1914 51 tons and 103 tons respectively.

Fishing.—Another considerable industry largely in European hands is that of pearl fishing, which has its centre at Dobo in the Aru Islands. Originally wholly in the hands of the Aru Islanders themselves, who still retain the sole right of fishing to a depth of 30 ft. at low water, pearl fishing in territorial waters, in so far as it does not infringe this right, has been leased by the Government to an Australian concern, the Celebes Trading Company. The head-quarters of the fleet is at Dobo, and in a good season they are said to employ about 100 luggers on

the fishing beds off the east coast of the islands. In 1914, mother-of-pearl to the value of £58,000 was exported from Dobo. This includes the value of the native product marketed by the Arab dealers.

European capital has been attracted recently to the growing of coco-nuts, for which there are several concessions, notably in Amboina. Its chief employment, however, is in purely trading operations, buying and selling native produce.

Minerals.—At Bula and Nief in Ceram there are petroleum bores, which in 1914 yielded 458 tons and 28 tons of crude oil respectively, and the output is said to have substantially increased down to 1916. Although coal has been reported to exist in Halmaheira, Buru, Ceram, and New Guinea, the only mineral concession has been made to the Bachian Exploration Company in respect of all mineral deposits in Bachian.

LESSER SUNDA ISLANDS

Timor and Dependencies

The administrative division of Timor and Dependencies comprises the islands of Sumbawa, Flores, the Solor, and Alor groups, situated in the main chain of the Lesser Sunda Islands and the islands of Timor (excluding the eastern half, which belongs to Portugal), Savu, Rotti, and Sumba, which together form a southern loopline. It is only within recent years that the pacification of this region has been taken in hand, and even yet it is not completely accomplished. Information as to economic conditions is therefore incomplete.

Native Production.—In the islands of the main chains two societies can be distinguished, that of the mountain dwellers of the interior and that of the coastal communities which are mostly of alien origin. The natives who live in the high country of the interior are agriculturists, while those on the coast are traders, fishermen, and engaged in the preparation of copra. Between the two there is a certain amount of trade on a small scale.

Agriculture is everywhere very primitive, chiefly on *ladangs*. Maize is the chief crop produced for home consumption; a small quantity is also exported. Rice is raised on *sawahs* and *ladangs* in western Sumbawa and by the natives of West Sumba, being in both places the chief foodstuff. Elsewhere

it is a luxury. In Timor there are experimental *sawahs*, but as yet the Timorese have no notion of irrigation, and only the most primitive means of ploughing. The export of rice from the whole province is not inconsiderable, being 1,078 tons in 1913. Nearly double this quantity was imported during the same year.

All kinds of vegetables are grown to eke out the food supply, and a quantity is sold to people on the coast. Timor onions are well known.

In Savu and Rotti the lontar palm furnishes palm sugar, which is an important article of native diet in these islands; in Timor palm-wine is made from the sap, the nuts are used as a foodstuff, and mats are made from the leaves.

Tobacco is grown in the highlands of Sumbawa and Flores, but mainly for local consumption. There is a small export from Maumere on the north coast of Flores.

Cotton is grown both in Flores and in Sumbawa. In East Flores experiments have been carried out under the supervision of the Dutch administration, and hopes are entertained of a successful future for the crop. There is a small export to Savu and Roti.

Coffee-growing exists in the Manggarai and Ngada districts of Flores. Both Java coffee and *Robusta* coffee are cultivated, the latter being a recent experiment in Manggarai. A small quantity is exported annually to Makassar. In Sumbawa coffee is grown for home consumption.

The coast dwellers, who are chiefly Buginese and Makassarese, carry on an active fishing industry, trepang and mother-of-pearl, along with other marine products being obtainable round the shores of the different islands. The natives of Timor and Sumba, where society is more homogeneous, are averse from seafaring.

As everywhere else round the coasts of the Dutch possessions, coco-nut cultivation is extending in Timor and Dependencies. A remarkable instance showing the appreciation by the coast people of the economic importance of copra is afforded in the Endeh district of Flores, where the dominant Makassarese have let out the ground to their former slaves for purposes of agriculture, while they themselves devote their energies to growing coco-nuts. Copra is perhaps the most valuable product of the province, and in 1913 was exported to the value of £70,900.

Timber and forest products, originally of importance, are not so now. Sandalwood is exported from Timor and Sumba, while in Sumbawa there is a little teak. Dye-woods, of which sapan wood is the chief, are found in all three islands, though the largest quantity is in Sumbawa. Export is inconsiderable. Wax and wild cinnamon are other forest products exported.

An industry almost as important as agriculture and fishing is that of cattle and horse breeding. According to official statistics the number of buffaloes and horses in the province is much greater than in any other province of the Outer Possessions. There are different breeds of horses in the different islands. The Sandalwood breed from Sumba is the best known and is thought by some to be the best breed in Netherlands India. Although the biggest, it stands little over twelve hands. In Sumbawa there are two kinds, the Sumbawa in the west and the Bimanese in the east. The Sumbawa, though not so big, is better for draught purposes than the Sandalwood; the Bimanese is of lighter build and more suitable for riding. The ponies of Savu and Rotti are similar to the Bimanese. There is also a Timor breed much used by the natives of that island. In all the islands the horses run wild, and no attempt is made at selective breeding. As the best animals have been exported for use in the cavalry, the breed has deteriorated considerably. Lately, however, the Government has taken steps to improve the stock by furnishing Arab and other stallions. Though exporting considerably less than Bali and Lombok, Timor and Dependencies, for the export of cattle and horses, is second in importance in the Outer Possessions. There is also a brisk trade in horns and hides.

Minerals are found in small quantities in some of the islands; iron, brimstone, pumice-stone, and saltpetre in Flores, and gold, copper, and gypsum in Timor. For some time it was thought that tin existed in Flores, but recent investigations revealed no trace of it. According to an official publication, petroleum is known to exist in Timor.

European Enterprise.—Private European enterprise is practically non-existent. Experiments with tea and sugar-cane in Timor came to nothing. In Sumbawa there is a concession of over 17,000 acres for the cultivation of coco-nuts, coffee, tobacco, and cotton.

Bali and Lombok

Native Production.—Native agriculture among the Balinese people of Bali and Lombok stands at a very high level, higher even than in Java.

Rice is the chief foodstuff, and it is cultivated almost entirely upon *sawahs*. In the building of reservoirs (*waduks*), the construction of aqueducts and arrangements for drainage, the Balinese excels. Moreover, the natives have their own irrigation associations or *subaks*. Each of these associations controls a district with its own water supply, the distribution of which is systematically arranged. The association further enacts rules governing the possession and alienation of fields, the planting of the ground, the tending of cattle, and the collection of *landrente*. It arbitrates also in disputes between *sawah* proprietors.

In 1914 an area of 135,875 acres of *sawah* was irrigated by running water, and 67,110 acres were dependent on rain, in Bali and Lombok. There was no record of *ladang* cultivation. In the production of rice the position of the Residency is the most favourable of all the provinces of the Outer Possessions, the total production in 1914 being 4,193,771 pikols. The Buleleng division imported a little, but in Jembrana and South Bali the harvest was so abundant as to permit of considerable export. Against an import of 3,044 tons, Bali and Lombok exported 11,600 tons in 1914.

In Bali, which formerly yielded almost the entire production of ground-nuts in the Outer Possessions, the output is now diminishing. From Buleleng in 1914, 25,988 pikols were exported, as compared with 39,014 pikols in 1913.

Cotton cultivation occurs in Lombok, but only on a small scale. Experiments undertaken there with foreign varieties have proved unsuccessful. There are no ginning appliances on the island, and the raw product is exported from Ampenan. In 1914 about 8,523 pikols were exported, a decrease on 1913.

Copra production is very considerable, the export being 15,708 tons in 1913. The officials of local administration are endeavouring to induce the natives to exercise greater care in the preparation of this commodity. The prevalence of the coco-nut tree enables the natives to participate to a considerable extent in the interprovincial trade in coco-nut oil.

In the hill districts a good deal of coffee is grown, mainly for markets within the colony. Here again the authorities have difficulty with the natives on account of the lack of care bestowed on the cultivation and in harvesting the fruit. That prepared for the market by Chinese is superior to the product prepared by natives. Buleleng in 1914 exported 34,203 pikols.

In both Bali and Lombok a quantity of native-grown tobacco is produced, and the bulk of this goes to the native market. Other products of the residency are indigo, areng, and lontar palm, fruit in Karang Asem, and onions in the Batur district.

An occupation among the Hindu Balinese, second only to agriculture, is that of cattle and pig-breeding. In Buleleng especially, attention unusual among natives is devoted to stock-rearing. The Government encourages the import of Australian and Bengalese breeds of cattle. The export of cattle is more important in Bali than elsewhere in the Outer Possessions, and there is besides considerable export of hides and horns.

Although expert metal working is carried on by the natives, minerals are not found in any quantity. In 1912 Bali and Lombok were prospected for minerals, but the result is not available.

European Enterprise.—Apart from two or three companies which maintain plant for peeling rice by machinery, there is little European capital invested in the province.

CHAPTER XII

COMMUNICATIONS

I.—SHIPPING AND PORTS

External communications—Inter-insular and coastwise communications—Conditions during the war—Ports—Shipping statistics—River transport.

EXTERNAL COMMUNICATIONS

IN a consideration of the sea communications of Netherlands India there are two conditions which it is necessary to bear in mind: (1) the comparative economic importance of the different islands; (2) the position of the chief economic regions in relation to the principal markets of the world, and in this last condition is implied their position in relation to the main trade routes. To the second of these conditions reference has been made in Chap. I.

The great volume of traffic is westward to Europe; the bulk of the imports are from Holland and Great Britain. There is considerable trade with Asiatic countries—Singapore and British India to the west, and Japan and China to the north. Another connexion of importance is that with Australia, and one, which has developed since the outbreak of war, with America. Excepting the east coast of Sumatra the colony lies slightly aside from the main route to the west, with which the natural point of contact is at the port and emporium of Singapore. The geographical position of Singapore makes it the natural centre of the whole western system of communications of the Dutch colony. But the political and economic importance of Java is such as to warrant the maintenance of direct communication between the island and Europe. Still, this is largely artificial and due to the dependence of Holland on the colony. The development of Belawan and possibly of other ports on Sumatra East Coast may affect, though not seriously, the unique position of Singapore.

In relation to China and Japan the role of Java is more important; and the island lies on the direct route from Singapore to Australia.

The following description is of the situation before the war ; such changes as are known to have taken place in 1915 are specially mentioned in a separate paragraph.

Europe.—The Nederland S.S. Co., a Dutch firm, maintained cargo and mail-boat services between Holland and Netherlands India. The mail service which sailed fortnightly followed the route Amsterdam – Southampton – Lisbon – Tangier – Algiers – Genoa – Port Said – Suez – Colombo – Sabang – Singapore – Batavia. A weekly through freight service from Amsterdam to all ports of Netherlands India, with transshipment at Sabang, Padang, Singapore, Batavia, and Surabaya to the steamers of the Koninklijke Paketvaart Maatschappij, called at the ports of Sabang, Penang, Singapore, Padang, Batavia, Semarang, Surabaya, with occasional calls at Cheribon, Pasuruan, Probolinggo, and Panarukan. A third service was run in conjunction with the Rotterdam Lloyd, departing fortnightly from Amsterdam and Rotterdam alternatively, and called at Genoa, Penang, Singapore, Sabang, Semarang, Surabaya, Balik Papan, and Makassar. The boats of the Nederland Co. were used for the transport of mails, government products, and government passengers, and received a subsidy from the Government. A subsidy from the Italian Government is also mentioned.

The Rotterdam Lloyd, the sister company of the Nederland, was founded in 1883, and runs a fleet of mail-boats and cargo steamers. The company ran a fortnightly mail-boat service alternatively with the Nederland. It started at Rotterdam and called at Southampton, Lisbon, Tangier, Marseilles, Port Said, Suez, Aden, Perim, Colombo, Padang, and Batavia. Like the Nederland the Rotterdam Lloyd carried mails, government passengers, and goods, and received a subsidy. Both companies were members of the combines known as the Dutch Shipping Union and the Java Pool.

The Netherlands Ocean S.S. Co. is registered at Amsterdam but is almost entirely owned by Alfred Holt & Co., of Liverpool. With four cargo steamers it maintained a regular service in conjunction with Ocean S.S. Co., Ltd., between Java, Liverpool, and Amsterdam. The company is a member of the Java Pool.

The German-Australian S.S. Co. with ships from 7,000 to 14,000 tons maintained three services which served Netherlands India—two on the return journey from Australia and one direct.

Of the two returning from Australia one touched at Makassar, Java, Singapore, Cochin, Marseilles, and the second at Chilahap, Batavia, Padang, Marseilles, on their way to Hamburg. The direct service every six weeks from Hamburg called on the outward journey at Antwerp, and sailed via the Suez Canal to Makassar, Sabang, Padang, Batavia, Cheribon, Semarang, and Surabaya, then back via the Suez Canal to Hamburg. This company shared with the Nederland, Rotterdam Lloyd, and the Ocean the bulk of the freight traffic to Europe.

Less direct means of communication was afforded by the Peninsular and Oriental S.N. Co., whose service to China and Japan connected at Singapore with the inter-insular system of the Koninklijke Paketvaart Maatschappij and a branch service maintained by the P. and O. to the Deli coast in Sumatra. At Singapore also, the fortnightly service of the Messageries Maritimes from Marseilles to China connected with the K. P. M. system. At the same port there were from the main service to the East of the North German Lloyd branches to Deli and Asahan, on Sumatra East Coast, to the northern Moluccas, and via Batavia, Makassar, Amboina, and Banda to German New Guinea. There was a branch line also from Penang to Deli.

China and Japan.—The Java-China-Japan Line, established in 1902 as a joint enterprise of the Nederland and Rotterdam Lloyd, has contracted with the Netherlands India Government to make at least 13 voyages annually. From the Government it was in receipt of a decreasing subsidy extending over the first fifteen years, and this has to be repaid gradually out of its profits. The company possessed 8 boats with a tonnage of 3,000 to 6,000 tons and maintained two services. The first, which ran two to three times monthly, started from Batavia on the round Cheribon-Semarang-Surabaya-Makassar-Hong-Kong-Muntok-Batavia. The second, starting at Surabaya, called at Semarang, Cheribon, Batavia, Hong-Kong, Amoy, Shanghai, Maji, Amoy, Hong-Kong, Banka, Billiton, Batavia, Cheribon, Semarang, Surabaya. Cargoes carried on the company's steamers are said to be chiefly sugar to Japan and rice from Saigon to Java. Chinese coolies for the mines of Banka and Billiton are carried, and the ships are chartered by the Government for the purpose of repatriating the labourers. The ships' officers of this line must be of Dutch nationality.

The Nanyo Kusen Kaisha, a Japanese line, founded in 1912

and in receipt of a subsidy from its Government, accomplished 15 sailings annually on the route Kobe, Maji, Hong-Kong, Singapore, Batavia, Surabaya, Semarang, Makassar, and back via Saigon, Keeling, and Kobe. This line was a keen competitor of the Java-China-Japan Line and each company offered a considerable rebate to shippers binding themselves to ship exclusively by the one line. The Chinese of Java are said to have boycotted the Japanese line.

Besides these lines running directly to China and Japan, there are those from Europe with which junction is effected at Singapore.

Siam.—The K. P. M. ran a monthly service to Bangkok.

British India.—The Rotterdam Lloyd and, the Nederland Companies together maintained a service via Rangoon to Bengal. They made 19 voyages in the year and sailed monthly or bi-monthly according to the season of the year. Sabang is a regular port of call on this route. The British India Steam Navigation Co. of Glasgow and the Asiatic Steam Navigation Co. of Liverpool maintained services of cargo-steamers running between Java and British India where they called at the ports of Rangoon, Calcutta, Colombo, Pondicherry, and Madras. They voyaged also to Bombay and Karachi. The great bulk of the freight consisted of sugar.

Arabia.—The Nederland and Rotterdam Lloyd run a joint service for pilgrims to Jidda.

Australia.—A direct and regular service to Australia was maintained by the subsidized K. P. M., in which enterprise the Government originally undertook to bear a proportion of the loss. Batavia was the port of departure, and the ports of call were Semarang, Surabaya, Thursday Island, Brisbane, Sydney, and Melbourne.

The ships of the Burns Philp Line on their way from Singapore to the east coast of Australia through the Torres Strait called once a month at Java. From Singapore also a combined service of the British India Steam Navigation Co. and the Ocean S.S. Co. ran at irregular intervals to Western Australia. The West Australia S.N. Co. ran from West Australia to Surabaya and back. The North German Lloyd maintained a service of cargo-steamers to which reference has already been made, with six sailings yearly from Australia to Europe via Javanese ports and Padang, in Sumatra West Coast, while

another German service between Australia and Java maintained by the joint efforts of the German Australian S.S. Co. and the Hansa S.S. Co. has already been referred to above.

U.S.A.—The same combination of German firms maintained a regular monthly service between Java and New York.

Several of the petroleum companies maintain tank steamers for overseas traffic ; the biggest fleet belongs to the Anglo-Saxon Petroleum Co.

Statistics.—The foreign traffic with Netherlands India was, in 1914, shared by ships of the different nations as follows :

<i>Inward</i>				
<i>Steamships.</i>			<i>Sailing Ships.</i>	
	<i>No.</i>	<i>Tonnage.</i>	<i>No.</i>	<i>Tonnage.</i>
Great Britain . . .	3,694	1,832,589	2,892	188 202½
Netherlands . . .	243	907,467	—	—
Netherlands India . .	1,767	1,065,655	164	2,824
Germany	282	459,383	1	4,570
Japan	56	147,242	—	—
China	—	—	428	22,598
France	3	884	—	—
Norway	55	88,275	4	2,471
Sweden	18	46,256	—	—

<i>Outward</i>				
<i>Steamships.</i>			<i>Sailing Ships.</i>	
	<i>No.</i>	<i>Tonnage.</i>	<i>No.</i>	<i>Tonnage.</i>
Great Britain . . .	3,916	1,929,691	2,770	180,434
Netherlands . . .	244	902,876	—	—
Netherlands India . .	2,033	1,150,399	—	—
Germany	240	354,512	1	4,570
Japan	52	139,474	—	—
France	3	884	—	—
Norway	48	74,151	4	2,471
Sweden	18	46,256	—	—

The outward figures for China are not stated. The year 1914 was not, owing to the outbreak of war in August, a normal year, but the only nation seriously affected was Germany, whose inward steamship tonnage, 635,226 in 1913, fell in 1914 to 459,383. The tonnage cleared was naturally subject to a greater reduction. Otherwise the most noticeable feature of the statistics for the years preceding 1914 is the rapid increase of Japanese shipping and the decrease in French. The number of Chinese sailing-ships shows a considerable increase during the three years preceding 1914.

INTER-INSULAR AND COASTWISE COMMUNICATIONS

The inter-insular and coastwise traffic (for this is what is comprised in the term *kustvaart* or coasting trade as it is applied to Netherlands India) was open to ships of all flags between ports open to general trade. Between other ports not in that category the coasting trade could only be carried on by Dutch ships, ships registered in Netherlands India and by native boats. There were about 70 ports open to general trade. To ports belonging to those regions of the colony not under the direct rule of the Dutch, access is available to ships of all nationalities.

The western and vastly more important system of local sea communications of Netherlands India comprises the littorals of West Borneo, northern Java, and the east coast of Sumatra, and the seas enclosed thereby. The natural centre of this system is Singapore, to which the general trend of traffic is inclined, but this to some extent is counteracted by the political and economic pull exercised by Java. It has not, however, been possible to treat the subject regionally, although from the facts that follow the importance of the western system will be apparent.

The Koninklijke Paketvaart Maatschappij.—Inter-insular steamer traffic was to a considerable extent in the hands of the subsidized Koninklijke Paketvaart Maatschappij, which acted as a 'feeder' company to the Nederland and Rotterdam Lloyd. In contrast to its predecessor, which was financed mainly by British capital, the K.P.M. is wholly Dutch, with ships which are mainly of Dutch build and ships' officers of Dutch nationality. Its fleet consisted in 1914 of 60 passenger ships, 20 freight ships, and 4 stern-wheel river boats; the largest vessel was about 5,000 tons. Since 1891 the company has carried all the inter-insular mails of the colony and was used by the Government for the transport of bullion and government passengers. The civil authority could charter its boats for special purposes.

Reference has been made to the special services to Siam and Australia maintained by the company; in addition to these it was bound to maintain local services on a minimum of thirteen routes. In practice the system embraced 48 routes and 300 ports. While the company is said to have possessed the

monopoly of passenger traffic, it experienced keen competition in freight-carrying. The compulsory services, in accordance with a Government ordinance of 1907, which has been amended and enlarged since, were in 1913 as follows :

*Compulsory
services.*

Sumatra

- No. 1. Once a fortnight from Batavia via Telokbetong, Kru, Benkulen, Padang, Oleh-leh (Oleë Lheuë), Sabang, Oleh-leh, Sigli, and Lho Seumawe to Langsa and back by the same ports.
- No. 2. Once in four weeks via Saibi (Mentawai Islands), Ayerbangis, Natal, Sibolga, Barus, Gunong Sitoli, Singkel, Tampat Tuam (Tapatuan), Analabu (Meulaboh), Chalang, Oleh-leh to Sabang, and back by the same ports to Padang.
- No. 3. Withdrawn by the Government.
- No. 4. Once in four weeks from Tanjong Priok (Batavia) via Muntok (in Banka), Palembang, Muara Saba by Jambi and back.
- No. 5. Once in four weeks from Tanjong Priok via Belawan (Deli), Tanjong Balai (Asahan), Labuanbilik (Paneh), Bengkalis to Siak, and from there back by the same ports to Batavia.

Borneo

- No. 6. Once in four weeks from Tanjong Priok via Sukadana and Sungei-Palembang (in the island of Great Karimata) to Pontianak in West Borneo, and back by the same ports.
- No. 7. Withdrawn by the Government.
- No. 8. Once a month from Surabaya via Langapura (Bawean), Banjarmasin, and Kota Baru (Pulu Laut) to Samarinda (Kutei, in South-East Borneo), and back by the same ports.
- No. 9. Withdrawn by the Government.

Celebes

- No. 10a. Once in four weeks from Makassar via Buton, Kandari, Salabangka, Bungku (Sakita), Kolonodale (Mori Gulf), and Luwu to Bunta and back by the same ports.

*Compulsory
services.*

No. 10b. Once in four weeks from Makassar via Bonthain, Saleier, Sinjai (Balangnipa), Bajowe, Palima, Kolaka, Palopo, Malili (Usu Bay), and back by the same ports to Makassar.

Lesser Sundas

No. 11. Once in four weeks from Surabaya via Ampenan, Sumbawa-besar, Beina, Waingapu (Nangamesi), Ende (in Flores), Savu, Roti, Kupang (in Timor), Atapupu, Ilwaki (Wetar), Kisar, Serwaru (Leti), Wulur (Damar), and back by the same ports to Surabaya.

Southern Moluccas and South-East New Guinea

No. 12. Once a month from Amboina via Banda-Neira, Tual (Kei Islands), Dobo (Aru Islands), Merauke (New Guinea), and back by the same ports to Surabaya.

Central Moluccas and West New Guinea

No. 13a. Once in eight weeks from Amboina via Saparua, Amahai, Banda-Neira, Geser Kaimana, Fakfak (New Guinea), Kokus, Wahai, Piru, and back by the same ports to Amboina.

Northern Moluccas and New Guinea North Coast

No. 13b. Once in eight weeks from Amboina via Kayeli, Laiwui (Obi Islands), Bachian, Ternate, Tobelo, Buli, Weda (the last three ports are all in Halmaheira), Serong, Manokwari (Dori), Run, Wakde, Humboldt Bay (New Guinea), and back, with few exceptions, by the same ports to Amboina.

Other Services.—Other services for passengers and goods were maintained by the K.P.M. without a subsidy and unfettered by obligation to the Government, and it is interesting to note that they all tended westward to Singapore and the region of recent economic development in the residency of Sumatra East Coast. They were as follows :

Every fourteen days from Surabaya via Batavia to Singapore and back.

Every fourteen days from Surabaya via Batavia and Singapore to Deli.

Every fourteen days from Batavia to Deli.

Two services, one every four weeks and another every fourteen days, from Singapore via Sumatra East Coast and Deli round to Penang.

Weekly from Sabang to Deli.

Weekly from Penang via Deli and Langra to Batu Bara and back.

Three services, each weekly, from Singapore via Penang to the ports of Sumatra East Coast.

Two services at irregular intervals between Pangkalan Brandan and the ports of Sumatra East Coast.

General Services.—Mention has already been made of the branch services in the archipelago of the small steamers maintained by the North German Lloyd, Ocean S.S. Co., and the Peninsular and Oriental S.N. Co. from Singapore and Penang to Sumatra East Coast ports. But apart from these special lines there is a host of small steamers plying along the coasts and from island to island. The bulk of this traffic has its centre at Singapore, whence steamers of a tonnage varying from 5 to 1,000 tons engaged in goods and passenger services chiefly to the mainland of Sumatra East Coast, the islands adjoining thereto, to western Java and West Borneo. Of about a dozen steamers engaged thus with West Borneo (to Pontianak and Banjarmasin), several sail under the British flag; the majority of the owners are Chinamen. The traffic with Sumatra East Coast and the islands of the Riouw Archipelago, Banka, and Billiton is much more considerable. In the intercourse with the economic region in the residency of Sumatra East Coast, Penang has an important share. Here also the majority of the owners are Chinamen, and the greater proportion of the traffic is under the British flag. There are special services of tank steamers which serve the petroleum districts in Borneo, Sumatra, and Java, and ports like Balik Papan in Borneo, the ports in Aru Bay and its vicinity in Sumatra and the port of Sambu in the strait of Singapore owe their importance chiefly to this traffic.

Government Services.—Steamers also engage in purely coastal traffic as distinct from inter-insular, and ply between the ports of Sumatra East Coast, round the entire coast line of Dutch

Borneo and along the north coast of Java. In 1912 the Government subsidized a service of motor-boats on a route between Batukalas, Pajandaran, Kalipuchang, and Chilachap on the south coast of Java. In the same year was instituted under the auspices of the Department of Public Works the East Java Sea Transport, consisting of a tug and about half a dozen cargo praus for the purpose of carrying packed salt from Kalianget factory in Sumenep (Madura) to the warehouses on the coast of Pasuruan and Besuki, and also for the purpose of transporting loose salt to the Kalianget factory. A fleet of about twenty-five small steamers and motor-boats, together with numerous craft of other kinds, was used by the Government for administrative purposes in different parts of the colony.

Native Traffic.—So far only steamers have been mentioned, and in what has been called the western system of communications they play the chief part. There is, however, engaged in the inter-insular and coastal traffic a large fleet of sailing ships, consisting of Chinese junks and native praus. Langkat and Padang are the principal centres in Sumatra and Banjarmasin in Borneo.

Eastward of the system of communication designated the western system, in a region roughly delimited by the Lesser Sundas in the south, the east coast of Borneo in the west, and New Guinea in the east, the character of the traffic changes so considerably that, though there is in practice no line of demarcation, it is possible to regard it separately under the name of the eastern system. Surabaya and Makassar and Amboina are its chief centres, and the steamer traffic is considerable as compared with the great number of sailing vessels engaged. The native boats are to a large extent owned and manned by the seafaring folk of Madura and of Bonthain in Celebes. Of 2,504 boats registered, in 1914, in Java, 1,560 were Madurese, and of 344 belonging to Celebes, 191 were from the Buginese port of Bonthain.

Statistics.—The general total of steamers belonging to Netherlands India in 1914, was 196 with an aggregate tonnage of 137,359. It is not quite certain, though it is probable, that these figures, which refer to boats of 2 tons and over, include the steamers of the K.P.M. The native and Chinese craft (*vaartingen*) for the whole colony in 1914 numbered 3,780, with

a total tonnage of 39,369 tons. Here again there is some uncertainty as to whether boats belonging to ports situated in territory not subject to the direct rule of the Dutch are included. These would not seriously affect the figures. A class for which no provision is made in the figures is a large lighter averaging 1,000 tons capacity, which appears in the shipping statistics of individual ports. Thus 57 of these vessels entered Palembang in 1914, and at Balikpapan, 102. These have only recently been in use, and it is possible that they are large cargo praus which are taken in tow by steam tugs.

CONDITIONS DURING THE WAR

Shortage of Shipping.—A report at the end of 1915 states that there was a shortage of shipping throughout the greater part of the year and a rise in charter rates. While connexion with Marseilles was not absolutely broken off, the services of the French Messageries Maritimes almost disappeared. The requisition of the boats of the Ocean Company by the British Government resulted in the Dutch mail services being overwhelmed with cargo. It was found impossible to charter British vessels, and neutrals imposed the impossible stipulation of being allowed to break their journey for private trade. A number of shipowners known as the Conference Lines took joint action on the cargo question, and it was agreed to reserve space for certain fixed products. By this means the export of sugar was in 1915 little less than in 1913, and more than it was in 1914. (See further the section on 'Commerce' in Chap. IX.)

New Lines.—Owing to the absence of much of the usual shipping and the diversion of trade in new directions, steamship companies new to the trade of Netherlands India made their appearance. The Conference Lines decided to permit exporters consigning goods to Genoa, and to the ports of France, Sweden, Norway, Denmark, and Baltic ports other than German, to ship by Det Ostasiatiske Kompagni of Copenhagen, the Norwegian Africa and Australia Line of Christiania, and Rederiaktiebolaget Transatlantica of Gothenburg. These lines were intended chiefly to replace the service to France, originally maintained by the Messageries Maritimes, which declined to take cargo either direct or from Singapore. Shipping

to France declined enormously in 1914 and 1915, while trade to Copenhagen was suspended.

Services to America.—Judging by the shipping activity on that route, trade between Netherlands India and America developed considerably since the outbreak of war. This development is represented by the figures: (1913) 100; (1914) 102; (1915) 123. Several new steamship services have come into being.

Java-New York Line.—In conjunction with the Conference Lines this company began a service to New York at the end of 1914. At the beginning of 1916 their boats were running once every four weeks.

Holland-Amerika Line.—In conjunction with the Conference Lines this company began a service between Java and New York. The first ship reached New York in December 1915, and began the return journey in February 1916.

Java-Pacific Line.—The cessation of the service of the Pacific Mail S.S. Co. induced the Java-China-Japan Line to open a service on the route Batavia, Semarang, Surabaya, Makassar, Manila, Hong-Kong, and San Francisco, and back by the same route. The first ship left Batavia in December 1915. The Nederland Royal Mail and the Rotterdam Lloyd lines have since entered the trade, and it was stated in August 1918 that the three lines together were sending at least three steamers a month in each direction across the Pacific.

At the end of 1915 the local traffic, disorganized by the shipping shortage, was not quite normal, owing to the use of ships on routes outside Netherlands India. Nine ships were put on the line to Australia, on which they carried sugar and maize on the outward journey, and coal on the return voyage. Several ships were employed to carry sugar to Rangoon, returning laden with rice. (From Dutch reports of January 1918 it appeared that the British authorities had recently temporarily suspended the export of rice.)

The K. P. M. put two ships on a new route from Deli via Singapore and Penang to Hong-Kong and other China ports, and this new venture is stated to have given good results. This new service was opened at the request of the Deli planters, who desired means of transporting coolies to and from China. A new line of the Japanese S.S. Co. between Java, Makassar, Sandakan, and Japan was reported in July 1918.

PORTS

Classes of Harbours

The harbours of Netherlands India are of three main classes : (a) Harbours open for general trade, for ships of all nations at peace with Holland. (b) Harbours to which only native vessels and those licensed for coasting trade are admitted. (c) ' Native ' harbours, being those which belong to the territories of native princes or other territories not under the direct control of the Dutch. To these all ships without exception are admitted.

In the first class is the harbour of Riouw which is also the only ' free ' port in the archipelago ; it is situated on the island of Riouw, opposite Singapore. Other ports in this class which are open to general trade but subject to their local regulations, were in 1913 as follows : Anjer, Bantam, Batavia, Indramayu, Cheribon, Tegal, Pekalongan, Semarang, Juwana, Rembang, Surabaya, Pasuruan, Probolinggo, Besuki, Panarukan, Banyuwangi, and Chilachap, in Java ; Padang, Priaman, Ayerbangis, Natal, Sibolga, Barus, Benkulen, Telokbetong, Palembang, Jambi, Bengkalis, Oleh-leh, Sabang, Sigli, Lho Seumawe, Singkel, Meulaboh, Sinabang, Kru, Langsa, Isli, Chalang, Gunong Sitoli, and Tapatuan, in Sumatra ; Muntok in Banka ; Tanjong Pandan in Billiton ; Pontianak, Pamangkat, Sambas, Singkawang, Banjarmasin, Sampit, Kota Baru, and Setagen in Borneo ; Makassar, Menado, Amurang, Ratah Totok, Kwandang, and Gorontalo in Celebes ; Amboina, Banda, and Ternate in the Moluccas ; Ampenan and Labuan Haji in Lombok ; Pabean in Bali ; Kupang in Timor ; Tual in the Kei Islands ; Dobo in the Aru Islands ; Merauke in New Guinea.

There are about 70 native harbours, and these include Belawan, Pangkalan Brandan, and others of importance on the east coast of Sumatra ; in Borneo the chief native harbours are Samarinda and Balik Papan.

The remaining harbours (of category b) are unimportant.

Harbour Dues, &c.

Netherlands India is divided into districts for the purposes of ship measurement, which function generally devolves on the local harbour-master, or, where there is no such person, on a government official who, in some cases, is the native *wedono*.

A harbour tax (in 1913, 16 cents per cubic metre) is levied on all ships entering any harbour or roadstead where import and export duties are collected. From this charge, ships with a capacity less than 60 cubic metres, local ships going occasionally beyond the buoys, or boats engaged exclusively in fishing, were exempt. The tax is due as soon as the ship enters the harbour, but cannot be levied again in the same or other harbour of the colony during the following six months. The government official responsible for the collection of import and export duties also collects the harbour tax.

Construction, Upkeep, and Administration

The construction and upkeep of harbour works are carried out by the Department of Public Works, while harbour administration is subject to the control of the Department of Marine. One account, dated 1914, states that the administration of important harbours is now subject to an official of the Water section of the Department of Public Works, assisted by an advisory board composed of the leading members of the commercial community and representatives of the Departments of Marine and Finance. In the *Kolonial Verslag* of 1915 there is no evidence of this.

Whereas originally the harbours naturally formed at river mouths sufficed for the purposes of coasting trade, the advent of ocean-going vessels necessitated anchorage in the 'roads', where the cargo was unloaded into native boats. This method still obtains in many harbours of the colony, although the Government is constantly engaged in making artificial improvements.

The following is a brief description of some of the more important harbours.

Java

Tanjong Priok is the harbour of Batavia. Originally the harbour formed by the Liwung sufficed for the needs of the small coasting vessels, and subsequently ocean-going ships anchored in the Batavia Roads where the cargoes were loaded and discharged by means of lighters. In 1877 the construction of an artificial harbour was begun at Tanjong Priok, a headland forming the eastern horn of the bay into which the Liwung flows. The port now consists of an outer and two inner

harbours. The outer harbour is enclosed by two stone breakwaters running north and south, the eastern being 6,150 ft. and the western 5,560 ft. in length; the breakwaters, which are about 3,600 ft. apart at the shore end, converge at the sea end where the entrance is about 525 ft. wide. The channel through to the inner harbour is about 28 ft. in depth at the entrance and $24\frac{1}{2}$ ft. at other places. The inner harbour first constructed was excavated into the land and is about 3,500 ft. long and 560 ft. broad with a depth at low-water of $24\frac{1}{2}$ ft. This harbour affords every facility in the way of quay space, storage, coal wharves, and oil supplies, and possesses cranes worked by steam and electricity. There is a floating dock with a lifting-power of 4,000 tons. The second inner harbour, which in 1914 was in course of construction, is situated to the eastward of the first, and when completed will have berthing with a depth of 40 ft. in its northern portion and 30 ft. elsewhere. Its length will be 3,300 ft. and its breadth about 500 ft. A new petroleum harbour is projected, while some way up the canal between Tanjong Priok and Batavia a new prau harbour is in course of construction.

Tanjong Priok is connected with Batavia by railway, road, and canal.

Semarang.—Eastward from Batavia about 250 miles along the north coast of Java is the roadstead of Semarang. The town straggles along the banks of a river and is separated from the sea by a low-lying marsh. Connexion between the town and the sea, originally along the Semarang River, is now by a canal. The silt which threatened the ruin of the river as a waterway also affected the canal, and it was found necessary to lengthen the western of the two moles by which the canal was conducted seawards. In 1914 a huge quantity of mud was dredged from the river and canal, and a further lengthening of the western mole was then contemplated.

The roadstead is open, and exposed to the north-west monsoon. Large vessels anchor three miles out, and cargo is discharged into lighters. A scheme for the construction of a spacious lighter harbour, with two basins for customs purposes and a small harbour for fishing vessels, is in course of execution. The total water space will amount to about 21 acres. Besides the customs buildings there will be five godowns, two bonded stores, and storage sheds. The new harbour will be connected by rail

with existing local systems. The town of Semarang is connected by rail with Surabaya along the coast to the eastward, with Surakarta in the interior, and by tramway with Cheribon. The railway to Surakarta is continued to Chilachap on the south coast and thence northwards to Batavia. Cheribon is on the direct northern route to Batavia. Out of a total population (1905 census) of 96,660 there were in Semarang 5,126 Europeans, 76,413 natives, 13,636 Chinese, and 698 Arabs.

Surabaya.—Further eastward along the north coast opposite the eastern end of the island of Madura by which the roadstead is protected is Surabaya. The town, second in importance in Java, is situated on the Kali Mas, while the Kali Sampir, a tributary, flows along the east side of the town almost parallel to, and distant 1,100 yds. from, the Mas. Both rivers are navigable only by boats. The neighbouring country is flat and intersected by boat channels, and for a considerable distance to the westward, marshy. Between the mouths of the Sampir and the Mas is the Government marine establishment which is equipped with modern mechanical and engineering appliances. The entrance to the Government basin is between two stone piers where a depth of 34 ft. at high water is maintained by dredging. For ordinary mercantile purposes communication with the land was, at any rate until recently, maintained by lighters which proceeded about two miles up the Kali Mas to the Customs House and the warehouses. The small frontage here available for storage purposes and the narrowness of the channel at low water led, in 1907, to expenditure on the construction of quays along the banks of the river, and the broadening and deepening of the channel. More recently, harbour construction on an extensive scale has been inaugurated. It is intended to create a large basin in the natural bay to the west of the mouth of the Kali Mas, which, when completed, will enclose an area of about 200 acres. There will be about 8,000 ft. of wharf for ships up to 29 ft. draught, about 1,200 ft. for small ocean-going vessels, and on the south side of the basin 1,000 ft. of quay for lighters. Storage accommodation is being erected in proportion, and there will be, besides, two floating docks of 14,000 and 3,500 tons capacity respectively and two floating steam cranes. It was reported in August 1918 that these works were nearing completion, and part of the wharf is in use. The railway runs seaward from Surabaya along the side

of the Kali Mas to Kali Mas station. In 1915 the population of Surabaya totalled 156,752, of which 8,063 were Europeans, 124,473 natives, 14,843 Chinese and 2,482 Arabs.

Chilachap.—The inlet of Chilachap on the south coast of Java is opposite the eastern end of the island of Nusa Kambangan. With the exception of Segoro Wedi Bay, Chilachap is the only harbour on the south coast affording protection during the south-east monsoon, and is safe at all seasons of the year for light-draught vessels. Moreover, it is the only port of importance on the south coast of Java. The town is situated on a tongue of land flanked on the east by the exposed Schildpadden Bay and on the west by the estuary of the River Donan. To the south it is protected from the Indian Ocean by the eastern end of Nusa Kambangan. The entrance to the harbour between a projecting headland of Nusa Kambangan and South Point on the tongue of land opposite, is $1\frac{1}{2}$ mile wide, but owing to a sandbank the channel varying from 29 ft. to 48 ft. in depth, is very narrow. Cargo is discharged and taken in at a quay on the eastern bank of the Donan. Recent undertakings for the improvement of the port will, when completed, allow of vessels of 23 ft. draught to berth alongside. According to the census of 1905 there were in Chilachap 295 Europeans, 15,060 natives, 894 Chinese, and a few Arabs.

In 1887 the town was connected by railway with Batavia, Surakarta, Semarang, and Surabaya, and as a consequence of the development of the hinterland shipping at the port has greatly increased.

Sumatra

Emmahaven.—At the northern end of Koninginne Bay, 3 miles southward of Padang on the west coast of Sumatra, is Emmahaven, the port of Padang. The bay, which runs in a direction north-north-west and south-south-east, is bounded by steep and wooded banks, the eastern shore being formed by a high ridge of hills. From the western shore of the bay a breakwater, nearly half a mile long, has been built, and this, with a shoal on which another breakwater stands roughly at right angles to the first, forms a basin about half a mile square with depths from 17 to 20 ft. The main breakwater, owing to heavy seas, is often in need of repairs. There are several wharves, including a coal wharf where coal from the

neighbouring Ombilin field is brought by rail to the waterside. Ships unable to come alongside load coal from lighters. Behind the wharves is considerable storage accommodation, and behind these again is the railway station with post and telegraph offices. The distance by rail to Padang is about $4\frac{1}{2}$ miles. When certain extensions begun in 1913 have been completed there will be 1,715 ft. of quay exclusive of coal wharfage, with storage accommodation in proportion. The port is connected with the Padang system of railways, which has sprung up round the Ombilin coalfield. Lately a railway has been projected, which will connect Padang on the west coast with the Siak estuary on the eastern side of Sumatra.

Sabang.—On the north side of the island of Pulo Weh, situated off Acheh Head at the northern extremity of Sumatra, is Sabang harbour. The harbour is at the head of a spacious bay nearly one mile in length, the entrance of which is not quite half a mile across, with a depth of 70 to 120 ft. The harbour proper is at the head of the bay, which is completely sheltered from wind and sea at all seasons.

The construction of harbour works began in 1898 under the auspices of the Sabang Bay Harbour and Coal Company, which in 1909 transferred its property to the Government; subsequently it was leased to the Company for a period of 50 years. The harbour is used chiefly for purposes of coaling, and five electric transporters are employed at the coal wharves of which the extent is 1,679 ft. Vessels up to 30 ft. draught can moor alongside, while iron lighters convey coal to ships lying at anchor in the bay. Welsh, Bengal, and Sumatran coal can be obtained. On the eastern side of the bay there is a petroleum wharf, and two tanks with a capacity of 4,000 tons. There is a floating dock and a slipway for vessels. No port or anchorage dues are charged. There is a Dutch settlement at the head of the bay with a combined post, telegraph, and harbour-master's office. The island is healthy and there are no epidemics. There is a submarine cable to Oleh-leh, and a wireless station; Dutch mail steamers and those of the K. P. M. make regular calls.

Belawan (Deli).—Belawan, said to be the most important port of northern Sumatra, is situated on Pulu Belawan, an island composed of mud and mangroves formed at the estuary of the Deli and Belawan Rivers. The harbour, constructed by

the Deli Railway Company, lies on the western side of the island. The entrance to the Belawan mouth of the River Deli had a depth in June 1914 of $14\frac{1}{2}$ ft. at high water, at which time only was it possible for big ships to enter. Abreast the town of Belawan the water deepens to 30 and 40 ft., while in the harbour itself there are depths from 30 to 36 ft.

Harbour construction and upkeep have been taken over by the Government. There are about 1,500 ft. of wharfage owned partly by the Government and partly by private companies, besides considerable storage space. The port itself is unhealthy, and Europeans reside at Labuan Deli, a few miles up river. The settlement, which is extending, includes a number of Chinese. Belawan is the terminus of the Deli Railway which crosses the channel south of the island by a bridge. There is constant steamship communication with Penang and Singapore, and the boats of the K. P. M., plying along the east coast of Sumatra, call at the port.

The economic development of the hinterland—Deli, Langkat, and Serdang—has of recent years given rise to a controversy as to whether the district would be better served by the Aceh tramway with a port in Langsar Bay or Aru Bay, farther to the north (see below). Meanwhile, attempts have been made to deepen the channel into the river mouth to enable big ships to enter at low water. A powerful dredger was set to work, and it was reported in 1915 that a depth of 10 to 14 ft. at low water is now maintained. The creation of an ocean harbour is contemplated, and the work was to have been begun in 1915.

Aru Bay.—A little more than forty miles to the north of Belawan is Aru Bay, which has been mentioned as a rival site for the port of the productive hinterland. The bay, inside the islands of Kumpei to the north and Sembilang to the south, is 6 miles in length and 3 miles broad, but a large portion of it is dry at low water, with numerous shallow passages leading to the various streams which discharge into the bay. These unite in two channels which may be considered as the continuation of the largest of these streams, principally the Besitan and the Salahaji.

The shores at the head of the bay largely consist of mud overgrown with mangrove trees; there are various islets of the same formation. On the shores of the bay there are no important settlements. The approaches of the bay are by the

Sembilang and Kumpei channels. The Kumpei Channel is between Kumpei Island and Sembilang Island and the Sembilang channel is between Sembilang Island and the mainland. The latter is the deeper of the two.

Petroleum steamers made great use of the pier on Pulu Sembilang where the Royal Netherlands Company had a branch.

On the mainland abreast the Sembilang pier, at the mouth of a small river, is Telok Tabuhan, the terminus of the Acheh Tramway. Here there is a pier.

Four miles south-east of Pulu Sembilang is Pangkalan Brandan, which lies about four miles above the mouth of the Sungai Babalan. At this place there is a fort and a petroleum pier. Pangkalan Brandan is the northernmost terminus of the Deli Railway. A road running from Pangkalan Brandan across the Besitan and Salahaji to Kuala Simpang in Acheh is in course of construction. By this means the various establishments of the Bataafsche Petroleum Company will be connected and a junction effected between the Deli railway system and the Acheh tramway.

Palembang.—The port of Palembang is situated about 54 miles up the Musi River, which flows into the Banka Strait. It is a tidal harbour, large ships being able to cross the bar only at flood tide. The town is built out from the river banks and is partly on piles. Europeans and important natives live on the left bank. On this side there are wharves, the most recent of which, built in 1909, is further down stream than the other. Near it are the offices of the K. P. M. Small steamers only can come alongside.

Palembang, which is the capital of the residency of the same name, has a considerable trade with eastern ports, in the Malay Peninsula, Siam, and China. There is also important trade with the hinterland and much up-river traffic. The steamers of the K. P. M. maintain a daily service via Muntok, in Banka, to Batavia, and there is regular communication with ports on the east coast of Sumatra. A railway between Palembang and Telokbetong on the Sunda Strait is in course of construction.

Telokbetong.—Telokbetong is the chief town and seat of the Government of Lampong district, and is situated at the head of Lampong Bay on the Sunda Strait. At Telokbetong there is a landing pier at which only small vessels can lie alongside.

Loading and unloading for bigger ships is by canoes. At Panjang, $2\frac{1}{2}$ miles to the eastward, there is a small harbour completely protected by a natural breakwater of reefs. This place is visited by the freight steamers of the Rotterdam Lloyd. A railway from Telokbetong via Muara Enim to Palembang is in course of construction.

According to the census of 1905 there were 62 Europeans, 2,774 natives, and 830 Chinese resident in Telokbetong.

Riouw or Tanjong Pinang.—The free port of Riouw or Tanjong Pinang is situated on the Tanjong Pinang peninsula, originally the island of Riouw in the Strait of Singapore, and separated from Pulo Bintang by a creek which has been filled up. The roadstead affords an anchorage in 15 ft. of water and there are two piers and a third in course of construction. There is communication daily with Singapore and once a fortnight with Batavia.

Borneo

Pontianak.—The port of Pontianak lies on the Little Kapuas River almost at the junction between it and the Landak, and 12 miles up the estuary. The entrance is obstructed by a bar of mud which only permits vessels of a draught not greater than 9 ft. to enter ; at neaps vessels of that draught must enter by the Padang Tikar to the southward, and from thence by the Southern Kubu branch to Pontianak.

The town is situated on low and marshy ground, and built on piles ; at high water it is partly inundated. On the tongue of land between the two rivers is the house of the Sultan. On the left bank are the Dutch administrative head-quarters, the garrison, and houses of a few Europeans and Chinese not in the service of the Government. This quarter of the town is the busiest, and here the Chinese have control of the trade. There is a wharf about 500 ft. in length at which vessels up to 12 ft. draught can lie alongside. For others it is possible to anchor in the river which at this point is 400 yds. wide. Round about the Sultan's house are the houses of the Malays and a colony of Buginese. On the right bank are a number of Chinese carpenters, and here there is important shipbuilding activity. Pontianak is the capital of the residency of West Borneo and the main outlet for the produce of the hinterland. It is a port of call for Chinese junks ; the main trade is with Singapore. In 1905

there were in Pontianak 223 Europeans, 13,278 natives, 7,085 Chinese, and a few hundred Arabs and other Orientals.

Banjermasin.—Banjermasin, the capital of the residency of South-east Borneo and the chief town of Dutch Borneo, is on the right bank of the River Martapura, 3 miles up from its junction with the Barito, and 12 miles from Cape Burung at the mouth of the Barito estuary. The width of the entrance to the estuary is 3 miles, but the navigable channel only about half a mile, and this again diminishes further up the river. The depth in the channel across the bar is about 6 to 18 ft., thence northwards for 6 miles, 18 to 24 ft., and from this point to Banjermasin 24 to 48 ft.

The Dutch quarter of the town is built upon the island of Tatos, a mud bank nearly covered at high water. Many of the houses are built on piles and rafts. There is a Chinese quarter on the left and natives on both banks of the river. Fifty-seven miles up from Banjermasin is the coalfield of Orange Nassau, which is worked by the Government. Before the war Banjermasin was included in two services of the K. P. M. In 1905 there were 455 Europeans, 12,684 natives, 2,581 Chinese, and 910 Arabs in Banjermasin.

Balik Papan.—Balik Papan Bay, on the east coast of Borneo, is a safe harbour at all seasons, and affords anchorage in a water space of 4 miles long by 1 mile wide, with depths from 36 to 72 ft. On the eastern side of the harbour not far above the entrance is the landing pier of the petroleum company; the biggest ships can moor alongside. Connexion with the oil-fields is maintained by means of small tank boats and lighters, besides pipe-lines.

Europeans live on the shore at Klandasan and between this place and Panjur via intervening landing-stages is a regular motor-boat service. The export trade is largely oil, and the port is likely to develop. Already it is spoken of as the fourth port of Netherlands India.

Samarinda.—The town of Samarinda is situated about a dozen miles up from the Mahakkandelta in Kutei. The entrance to the river is through the delta, of which the greatest breadth east and west is 20 miles and the greatest length north and south 40 miles, and in which there are four main channels—Muara Jawa, the southern; Muara Bekapi, which joins Muara Bayor the eastern and main entrance; and Muara Berau, the northern.

Muara Bayor, the principal entrance, about 30 miles long, is narrow and tortuous in the middle. After the junction of the two main channels the Mahakkan is 1,200 yds. across and maintains this breadth to Samarinda.

Samarinda extends for two miles on either bank of the river, the native quarter, partly built out on to the river being on the right bank. On this side also is the residence of the Sultan of Kutei. The European settlement is on the left bank. In 1905 there were 109 Europeans, 3,375 natives, and 1,162 Chinese at Samarinda.

Celebes

Makassar.—Outside Java, Makassar in south-west Celebes is probably the most important trading port in Netherlands India. Between the shore and a ridge of coral reefs half a mile out is a safe anchorage in deep water. Up to 1900 the port was served by its primitive harbour; the building of a screw-pile wharf with warehouse accommodation was begun in 1902 and a sea-wall in 1911. In 1914 an additional quay was put in hand; at this, when completed, ships of deep draught will be able to moor alongside. At the same time alterations to the lighter harbour were begun. The total quay space provided is 3,608 ft. for ships up to 30 ft. draught, 2,025 ft. for those up to 26 ft., and 1,148 ft. for lighters, with storage accommodation in proportion. The works are reported to be finished (July 1918). Large godowns with iron storage sheds have been built by a Dutch company, and other godowns are being built by a Japanese company.

Menado.—Besides Makassar there are few ports of any importance in Celebes. Menado, at the north-east extremity, is the capital of the residency of the same name and is situated on a spacious bay which, however, is exposed during the north-west monsoon, especially in the months of December, January, and February. From November to April sailing vessels generally anchor at Kema on the eastern side of the peninsula, whence goods are conveyed overland to Menado. At Menado the mole built out south of the Menado River can only take alongside, at low water, small praus and flat-bottomed boats.

The Moluccas

Amboina (Ambon).—The harbour of Amboina is situated on an inlet which penetrates Amboina Island in the central group

of the Moluccas for 14 miles. At the entrance it is about $5\frac{3}{4}$ miles in width and continues so for about 10 miles, when it contracts and forms a narrow passage leading into an inner harbour. The depths on the outer bay are very great and anchorages are few. The passage to the inner harbour widens into a basin 3 miles long by $1\frac{1}{4}$ mile broad. It is well protected, but owing to its unhealthiness is not used by ships. The town of Amboina is on the eastern side of the bay, a little over a mile short of the passage to the inner harbour, and about 8 miles from the entrance. Near the shore is Fort Victoria, and the European quarter is to the south and north-east of the fort. To the south-west is the Chinese quarter, while the natives live in the neighbouring *negories*. The European quarter of the town is regularly laid out with wide streets, many of which are paved with stone. There are several public buildings and two parks. In 1905 there was a total population of 8,328, including 879 Europeans, 539 Chinese, 277 Arabs, and 6,567 natives, counting Javanese and traders from Makassar.

Ternate.—The only other Moluccan port of importance is Ternate on the island of the same name in the northern group. In 1911 there were two piers, but only at the coaling jetty was there sufficient depth of water for large vessels. Communication with Singapore was maintained by the Wee Bros Line, a British firm, and the North German Lloyd. Connexion with Batavia is by the K. P. M., which also included Ternate in its service to northern New Guinea.

Lesser Sunda Islands and New Guinea

Owing to the undeveloped state of the Lesser Sunda Islands and New Guinea there is no port of importance. The roadstead of Singaraja on the north coast of Bali is frequented by steamships and a large number of native sailing vessels, but the anchorage is exposed and landing is difficult.

On the other hand there are one or two fine natural harbours like Bima Bay in Sumbawa, for which there is at present little use. Waingapu, in the south-west corner of Nangamesi Bay in Sumba, carries on a brisk trade with ports in Celebes, and is growing in importance.

At Fakfak in New Guinea, on the coast just south of McCluer Gulf, there is an excellent anchorage for small craft.

SHIPPING STATISTICS, 1914

JAVA.	Port.	Entered.	Tonnage.	Cleared.	Tonnage.
Batavia :					
Steamers	{ a	1,620	3,153,462	1,619	3,163,007
	{ b	57	1,983	57	1,983
Sailing vessels	{ a	23	13,243	23	13,243
	{ b	2,938	30,504	2,945	30,748
9 large Lighters.					
Semarang :					
Steamers	{ a	1,160	2,749,730	1,161	2,745,748
	{ b	3	239	3	239
Sailing vessels	{ a	18	16,503	18	16,503
	{ b	1,613	22,535	1,612	22,527
Surabaya :					
Steamers	{ a	1,238	2,615,612	1,227	2,578,831
	{ b	40	2,446	38	2,296
Sailing vessels	{ a	—	—	2	2,643
	{ b	10,767	86,189	10,763	87,981
2 large Lighters.					
Chilachap :					
Steamers	{ a	151	443,851	148	433,341
	{ b	200	4,263	201	4,248
Sailing vessels	{ a	—	—	—	—
	{ b	—	—	—	—
SUMATRA.					
Telokbetong :					
Steamers	{ a	291	306,394	289	301,377
	{ b	18	201	18	201
Sailing vessels	{ a	2	471	1	286
	{ b	222	2,274	206	1,892
Padang :					
Steamers	{ a	414	1,028,789	409	1,005,196
	{ b	348	4,463	347	4,440
Sailing vessels	{ a	4	2,439	3	1,840
	{ b	1,272	10,225	1,286	10,279
1 large Lighter.					
Sabang :					
Steamers	{ a	733	1,710,117	718	1,658,178
	{ b	146	10,049	144	10,048
Sailing vessels	{ a	—	—	—	—
	{ b	—	—	—	—
Olehleh :					
Steamers	{ a	240	221,825	240	221,825
	{ b	142	9,942	142	9,942
Sailing vessels	{ a	—	—	—	—
	{ b	9	483	9	483
Pulo Sembilang :					
Steamers	{ a	217	203,179	216	202,025
	{ b	1,151	20,202	1,147	20,071
Sailing vessels	{ a	28	5,309	28	5,389
	{ b	1,431	30,597	1,420	30,209
6 large Lighters.					
Belawan (Deli) :					
Steamers	{ a	757	368,347	754	367,416
	{ b	444	6,991	443	6,965
Sailing vessels	{ a	36	4,726	34	4,512
	{ b	1,903	62,176	1,889	61,597
Palembang :					
Steamers	{ a	351	301,780	354	303,306
	{ b	215	3,133	214	3,106
Sailing vessels	{ a	18	8,909	17	8,552
	{ b	368	9,411	369	9,338
57 large Lighters.					

SHIPPING STATISTICS, 1914 (*continued*).

Port.		Entered.	Tonnage.	Cleared.	Tonnage.
BANKA.					
Muntok :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	328 3	365,503 70	328 4	365,503 105
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	0 173	5,556 1,469	9 172	5,556 1,461
BORNEO.					
Banjermasin :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	307 65	215,516 4,472	304 65	213,507 4,467
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	4 535	2,001 6,456	4 535	1,987 6,403
Balik Papan :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	445 334	518,043 8,385	441 335	520,618 8,392
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 164	— 4,100	— 161	— 4,100
		102 large Lighters.			
Samarinda :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	302 318	159,161 7,936	301 318	165,353 7,981
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 78	— 2,107	— 79	— 2,093
		100 large Lighters.			
CELEBES.					
Menado :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	135 1	254,069 91	135 1	254,069 91
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 58	— 406	— 58	— 406
Makassar :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	545 9	946,501 170	542 8	947,736 164
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 2,582	— 18,273	— 2,583	— 18,290
		1 large Lighter.			
MOLUCCAS.					
Amboina :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	104 64	172,261 1,100	99 64	163,711 1,100
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 428	— 2,852	— 420	— 2,816
LESSER SUNDAS.					
Singaraja :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	244 —	270,507 —	244 —	270,507 —
Sailing vessel	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	— 1,316	— 11,416	— 1,332	— 11,528
Ampenan :					
Steamers	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	157 —	219,596 —	157 —	219,596 —
Sailing vessels	$\left\{ \begin{array}{l} a \\ b \end{array} \right.$	1 460	111 4,889	1 460	111 4,889

a = Vessels over 100 tons, net register.*b* = Vessels under 100 tons, net register.

In the foregoing statistics only the ports in the first rank on the north coast of Java have been mentioned. There are several others, such as Cheribon, which show a high figure in ships entered and cleared, but these, as in a lesser degree, also Batavia and Semarang, to some extent, owe their place in the statistics to the traffic on its way to Surabaya, whose relative importance is consequently not apparent. Two other ports of the north coast of Java, not mentioned here, but of some importance, are Pasuruan and Probolinggo.

Sabang in Sumatra owes its high figure to the fact of its constant use as a coaling station, and this is also true of Setagen on the island of Pulu Laut, at the south-east corner of Borneo.

Sambu (not mentioned) in the strait of Singapore, is important only as a storage port for Bornese petroleum, and Pulu Sembilang in Aru Bay is used almost exclusively for exporting the same product.

RIVER TRANSPORT

The rivers of two islands only are of importance, those of Sumatra and Borneo. In Java the rivers are mostly rather a hindrance to communication than otherwise.

Java.—Some of the larger rivers are used in parts by native boats and rafts to transport agricultural produce, fish, and building materials. In East Java, the Solo and the Brantas are navigable in Rembang and Surabaya. The Solo is also used for shipping in Surakarta, and its tributary, the Madiun, in Madiun. The Brantas is navigable in Kediri. In Middle Java the north-coast rivers, while serviceable for agriculture, are practically useless for navigation. The swift flow of the rivers of this division which discharge into the Indian Ocean precludes any but the Serayu from being of use for transport. In West Java the Tarum is navigable from Chikao, and the Manuk from Karang Sambung. The only river of this division flowing into the Indian Ocean which is navigable for any distance is the Tanduwi, in East Preanger. The stony beds, shallows, and rapids in the rivers of the southern limestone ranges generally render them useless for navigation.

Sumatra.—In Sumatra there is a series of navigable rivers flowing through the eastern plain to the Malacca Strait. Even here the banks which form at the mouths of the rivers present a difficulty, and in most cases ingress for big ships is only

possible at high water. But of late years some progress has been made in deepening the channels to permit of ocean-going steamers entering at all states of the tide. In the upper reaches the removal of obstacles has been in some cases undertaken. The rivers in the north of the island are affected by the *bena*, a wave 3 ft. high, which runs up the rivers after each new moon. Rapids, and changes in the height of the river due to irregularity of the supply are also difficulties. The Talangbawang in the south is navigable for ocean-going steamers as far as Menggala, to which point there are regular services.

On the Musi in Palembang, ocean-going vessels can navigate as far as the town of Palembang, which is 54 miles above the pilot vessel at the entrance. From Palembang there are regular services of steam launches and motor-boats for over 200 miles up the Musi and its tributaries. It is possible for boats to penetrate about 330 miles inland.

The Batang Hari in Jambi permits of navigation by ocean-going ships as far as Jambi, about 50 miles from the mouth, and from this point motor boat and steam launch services extend for many miles up the main river and its tributaries. The maximum navigability of the Jambi is given as 497 miles.

On the Indragiri (Batang Kuantan) the ocean-going vessels can penetrate as far as Kulachenako, beyond which point there is a regular river service as far as Cheranti.

Pulo Muda, 18 miles up the mouth of the Kampar River, is said to be the limit of safe navigation for ocean-going ships. Owing to the bore and rapid tidal streams there is little traffic.

On the short Siak River fairly large steamers can penetrate about 70 miles inland to Pakan Baru.

Besides those described there are seasonal river services maintained in the upper reaches and on further stretches the passage of barges and lighters is possible.

Borneo.—Borneo is even more dependent than Sumatra on its river communications.

On the Kapuas in West Borneo the Government in 1911 started, in conjunction with the services of the P. K. M., a regular service between Pontianak and Sintang, 200 miles up river. When possible, places beyond are visited. In favourable conditions small steamers can ascend about 550 miles, and sampans 125 miles further. Besides government passengers and goods, private individuals and their goods are carried in

a houseboat towed by a tug, and accommodation is provided for colliers who are needed for the various undertakings up river. The service, at any rate for the first three years, did not pay. Generally, the Kapuas has the busiest river traffic in Borneo. In the delta the native freight boats have been supplanted by small steamers, of which there were in 1914 about 40. Several tugs were engaged in towing cargo praus up to Sintang and even further. These services, however, were not regular.

The largest and most frequented river of the south coast is the Barito, which is navigable for vessels drawing 12 ft. up to Banjarmasin on the Martapura, and for smaller craft many miles further ; in the west monsoon, vessels with a draught of 7½ ft. frequently reach Muara Teweh. The K. P. M. runs a service every fourteen days to Paruk Tyahu ; the other boats are owned mainly by Chinamen.

Other rivers in southern Borneo are the Kumai, navigable for ocean-going vessels that can cross the bar for about 15 miles ; the Sampit, broad and generally navigable 53 miles up ; the Mendawai, which moderate sized vessels can navigate for 170 miles ; the Kahayan, navigable for vessels of 8 to 10 ft. draught as far as Pahandut, 80 miles from the mouth. Steamships on the Martapura are able to penetrate to the town of the same name.

The chief river on the eastern side of Borneo is the Kutei or Mahakkan, which is navigable for ocean steamers up to Tenggarung, about 60 miles up from the sea. The K. P. M. maintains a service every 10 days between Samarinda and Long Iram ; other boat services between Samarinda and places on the upper river are maintained by Europeans and members of the family of the Sultan of Kutei.

On the upper reaches of Borneo rivers where steamship traffic ceases big decked rowing-boats are the chief means of transport for Europeans and wealthy natives, and where it is no longer possible to use tugs for towing cargo praus, smaller craft are employed. On the navigable rivers of Netherlands India, generally, extensive use is made of stern wheelers with small draught.

CHAPTER XIII

COMMUNICATIONS

II.—ROADS, RAILWAYS, POSTS, &c.

Java : Roads—Motor transport—Railways—Tramways.

Outer Possessions : Roads (Sumatra—Borneo—Celebes—Other islands)—Railways and Tramways (Sumatra—Banka and Billiton)—Cables—Telegraphs—Wireless Telegraphy—Telephones—Postal arrangements.

JAVA

Roads

THE old native roads of Java, which still exist in mountainous and thinly populated parts, were mostly tracks along which the native two-wheeled carts could be driven, or horse-tracks and footpaths in the more difficult country. The first main road, the great Post Road, was made by Daendels between 1808 and 1811, and since then Java has been gradually well supplied with roads, particularly in the north and centre.

The roads are divided into first-class roads, the main roads which are usually kept in repair by the Government, and are over 5 yds. wide ; second-class roads, about 4 yds. wide ; third-class roads, about 3 yds. wide ; and *desa* roads, which are kept in order by the village community. The natives do statute labour on the roads, except on those in important places and towns, and any manufacturer using a road for heavy traffic has to repair it at his own expense. For metalling gravel is mostly used, though the Java gravel is very soft, and is quickly ground to dust. Near the coast shells are used with a layer of brick or coral underneath ; lately broken stone and asphalt have been employed. The following table gives details concerning the roads repaired by the Government in 1903 ; statute labour, even under Government control, has been found unsatisfactory in the Preanger Residencies, so that a large proportion of the roads are repaired by the Government there.

<i>Residencies, not including Private Estates.</i>	<i>Length of roads in miles kept by the State.</i>			<i>Plate-girder and Lattice-girder bridges.</i>		<i>Arch bridges.</i>
	<i>1st class. Miles.</i>	<i>2nd class. Miles.</i>	<i>3rd class. Miles.</i>	<i>No.</i>	<i>Average length of flooring. Feet.</i>	<i>No.</i>
Bantam . .	77	171	715	214	32	150
Batavia . .	183	107	59	305	41	54
Preanger Resi- dencies	1,688	484	1,242	1,389	24	219
Cheribon . .	83	332	331	615	34	103
Pekalongan . .	150	224	482	1,221	27	98
Semarang . .	232	348	443	1,031	31	122
Rembang . .	81	225	379	762	30	32
Surabaya . .	304	364	327	873	36	154
Madura . .	110	49	568	204	31	13
Pasuruan . .	125	349	488	621	26	203
Besuki . .	98	318	274	237	34	119
Banyumas . .	51	123	535	587	29	141
Kedu . .	156	120	862	352	51	265
Madiun . .	50	240	457	417	32	64
Kediri . .	104	412	267	645	28	50
Total . .	3,492	3,866	7,429	9,483	30	1,787

The network of main roads was incomplete in the following parts in 1905 : Krawang, south part of Preanger, mountains of Cheribon, Tengger, and Pekalongan, parts of Semarang and Banjumas, south of Preanger, Kediri, Pasuruan, Bantam, and Besuki, and on Madura and Bawean. The secondary road-system is generally complete.

Motor Transport in Java

There is a line of motors for the transport of the produce of Government plantations and other goods to and from the Preanger Regencies, and in the Galuh division of Cheribon. The service is controlled by an official responsible directly to the Resident, and its head-quarters are at Bandung. Similar services work in the Residencies of Semarang and Kedu, with a committee at Semarang, and in Pasuruan. In Cheribon, Surabaya, Rembang, and Semarang contracts are made with individuals for the transport of official travellers by car or other conveyance.

Railways of Java

The railways and steam tramways of Java are of great importance to the economic development of the island. All parts of the island are served by rail or steam-tramway, and the volume of native traffic is considerable, consisting largely of people travelling to market or on family business ; work-

men usually live near their work. Native goods are usually carried free of charge by the passengers, since natives with large stocks or businesses are rare. The fares are low, a minimum fare of one cent (less than a farthing), being general on all the lines, as is necessary if the railways are to be of use to the natives, so that the profits have to come largely from the goods traffic; the average charge for the carriage of one ton for a distance of one kilometre is about one penny, but a ton of goods of small value is carried for as low a charge as $1\frac{1}{2}$ cents (about one farthing) for a kilometre in some cases.

The railways are divided into the Eastern State Railways (i. e. the lines east of Surakarta), the Western State Railways (i. e. the lines west of Jokyakarta), and the line of the Netherlands India Railway Company, from Semarang to the Principalities, with its branches.

State Railways.—Each of the two sections of the State Railways, the eastern and the western, has its own general manager and staff, and there is a chief inspector controlling the whole system. The head-quarters of the eastern lines are at Surabaya, and those of the western lines at Bandung. In 1914 the receipts were £1,315,000 in the east (net profit, £625,646), and in the west £1,344,152 (net profit, £561,433). The less favourable financial position of the western lines is due to the more difficult nature of the country and the lack of the remunerative sugar traffic of East Java. The lines have a gauge of 3 ft. 6 in., including 75 miles of tramway of the normal gauge, and the line from Batavia to Buitenzorg (taken over from the Netherlands India Railway Company in 1913). They have a length of 1,564 miles—657 miles in the east and 907 miles in the west, with 359 stations and halts. There are 433 locomotives in use, which also run on the tramways with normal gauge, and of which particulars are given in the table on p. 407.

In addition there are the 4-6-0 engines used for goods and mixed trains, and the 2-4-0 small tank engines used for fast passenger trains, which belong to the Batavia-Buitenzorg line taken over from the N. I. Co. There were 1,160 carriages in use in 1914, 253 luggage vans, and 9,177 trucks. The latest type of carriages are eight-wheeled corridor coaches, weighing about 12 tons, and sometimes having an open platform at

the end, but a number of older four-wheeled carriages are also employed. Eight-wheeled dining-cars, weighing about 15 tons, are run on express trains. The majority of the trucks have four wheels (though there are a few with eight) and take an average load of $8\frac{1}{2}$ tons. All couplings are of central and semi-automatic type, and there are no side buffers. The very light rails, weighing 17 lb. to the foot, have been changed on the main lines for rails weighing $22\frac{1}{2}$ lb. to the foot; the permanent way is of the ordinary continental type. The signals are disc signals, worked by double wires from the station, from which they are never far distant. Points are moved by hand-levers at the points themselves. There are three classes on the eastern lines, and four on the western; in the east 97 per cent. of the passengers are third class, 2 per cent. second class, and less than 1 per cent. first class. In the west 91 per cent. are third class, 4 per cent. are fourth, 4 per cent. are second, and 1 per cent. are first. In 1914 1,834,440 tons of goods, not including materials for use on the line, were carried in the west, and 2,607,000 tons in the east, with a total of 25,000 tons of luggage. Goods traffic is fairly evenly divided over the whole year in West Java, but in the east and centre there is a busy period from May to November, when the sugar is transported from the factories to the shipping centres. Sixty-nine people were killed on the railway in 1914.

<i>Type.</i>	<i>Cylinders.</i>	<i>Driving wheels.</i>	<i>Weight in working order.</i>		<i>Heating surface.</i>	<i>Where employed.</i>
		<i>ft. ins.</i>	<i>tons.</i>	<i>cwt.</i>	<i>sq. ft.</i>	
Simple, with tender, 4-6-2	18 × 23½	4 11	87	12	1,700	Surabaya-Banjar.
Simple, tank, 2-12-2	21 × 20	3 8	75	8	1,660	Banjar-Chibatu.
Compound, tank, large, 2-6-6-0	13½ } × 20	3 8	61	18	1,490	{ Chibatu onwards. Heavy goods and mixed trains in E. Java.
Compound, tank small, 2-6-6-0	13½ } × 20	3 8	57	4	1,460	
Simple, with tender, 4-4-0	15 × 23½	4 11	53	18	1,100	Level track outside Batavia.
Compound, with tender, 4-4-0	15 } × 20	4 11	51	11	920	Surabaya-Pasuruan.
Simple, with tender, 2-4-0	15 × 18	4 8	32	12	560	Surabaya-Pasuruan.
Compound, tank, 0-4-4-2	12 } × 20	3 8	40	18	1,090	Padaralang-Buiten- zorg. Gradients severe, but trains light. Two engines frequently used.
	18 }					

The main line of the State Railways runs from Batavia to Surabaya. On leaving Batavia the line is level for a short distance, but soon begins the climb to Bandung, which is over 2,000 ft. above sea-level. From there to Chibatu it winds along the mountains, with considerable changes of level, and then drops steeply to Banjar, and more gently to Maos. Gradients on this mountain section are very severe, 1 in 50 being common, and 1 in 45 occurring in places. Curves are very sharp, and short, high bridges over deep and narrow ravines numerous, but tunnels are few, there being only four in the whole of Java. From Maos to Jokyakarta the line rises slightly, falls a little to Surakarta, and is fairly level the rest of the way to Surabaya. In this section several large rivers are crossed, and the bridges have to be built to withstand the sudden heavy storms, which quickly swell the rivers. The chief branch lines on the State Railways are from Surabaya to Banyuwangi, with a branch to Panarukan; from Batavia to Cheribon, with steam-tramway to Semarang; from Batavia to Labuan, with branch to Anjer Kidul; and the loop-line round the Arjuna and Kawi Mountains via Banggil and Malang, rejoining the main line at Kertosono.

With the exception of a short length in Batavia, the whole system is single line, but the express trains are not delayed at all at passing stations. The service consists as a rule of one or two fast trains, and some six or eight slow 'mixed' trains, stopping at all stations. Goods trains, not conveying passengers, are also run, but the larger part of the traffic is carried by the 'mixed' trains; this applies also to some of the tramways. No trains are run at night, as the Dutch do not trust the natives, who form most of the railway staff, though there is a fair number of Dutch and half-castes among them. The distance from Batavia to Surabaya is about 540 miles; the quickest time now is $24\frac{1}{2}$ hours, which is good running considering the small gauge and the nature of the line. If night running was allowed, the journey could be done in about 18 hours. The longest non-stop run is from Surakarta to Madiun, $60\frac{1}{4}$ miles in 89 minutes going eastward. Trains ran in 1915 at an average of 40 miles an hour in the plains, for which speed the 3 ft. 6 in. gauge has proved quite suitable, and it was then proposed to run still faster trains.

State Railways in construction and recently opened.—A line

is in course of construction from Banjar to Parigi, and one from Cheribon to Kroya was opened at the beginning of 1917. The Banjar-Parigi line was to be finished in 1918, and was open as far as Kalipuchang in 1916. Narrow-gauge tramways are also being built in Krawang and Besuki.

Netherlands India Railway.—The Netherlands India Railway Company's line from Semarang to Surakarta and Jokyakarta is a level line ; the inclines are slight and the curves have a wide radius. In order to avoid the mountains, particularly the volcanic group of the Merapi and the Merbabu, a somewhat circuitous route is taken ; it is 71 miles by the road from Semarang to Jokyakarta, and 103 miles by the railway. Considerable difficulties had to be overcome in the construction of the line ; the largest bridges are the iron bridge over the Tuntang, with a span of 164 ft., and the bridge over the Serang consisting of two iron sections of 66 ft., and one of 92 ft. The workshops are at Semarang and Jokyakarta. The stations are very simple, the following being the most important ;

Semarang, which lies to the north of the town, near the shore, and has extensive workshops, and branch lines to the harbour canal and to the warehouses.

Kedungjati, junction for the Willem I branch.

Gundik, junction for the tramway to Purwodadi, and starting-point of the tramway to Surabaya.

Surakarta, or *Solo*, junction for the eastern lines of the State Railway.

Jokyakarta, originally the terminus, but the line has since been continued to *Jokya Tugu* (a distance of about half a mile), the terminus of the western lines of the State Railway. By laying a third rail so as to provide the narrower gauge between Surakarta and Jokyakarta, the two systems of the State Railway have been connected, and it is thus possible to transfer freight without the change from the narrower gauge of the State Railway to the broader gauge of the Netherlands India line. Jokya Tugu is the junction for the Jokya-Brossot and Jokya-Willem I tramways. The central offices of the railway are at Semarang, in the neighbourhood of Bojong.

The construction of the line from Kedungjati to Willem I was fraught with great difficulties owing to the mountainous nature of the country ; the line was projected for military

TRAMWAYS OF JAVA

<i>Name of Company. Places served by Tramway.</i>	<i>Length. Miles.</i>	<i>Gauge. ft. in.</i>	<i>Engines.</i>	<i>Trucks.</i>	<i>Car- riages.</i>	<i>Number of Passengers.</i>	<i>Goods, Tons.</i>	<i>Remarks.</i>
Netherlands India Jokyakarta-Brossot. Railway Co.	15½	4. 9	7	5	—	787,977	114,862	Mostly along high road; curves therefore have small radius, but not too small for railway rolling stock.
Netherlands India Jokyakarta-Magelang-Willem I-Parakan.	69	3. 6	40	326	44	2,520,876	171,553	Magelang-Willem I is cog railway: highest point Bedono, alt. 2,332 ft.
Netherlands India Gundik-Surabaya, with branch Sumari-Grisee.	152	3. 6	53	1,000	164	3,122,122	367,602	Gundik-Surabaya almost all along separate road. Goods traffic heavier than on any other tramway. Forms connexion between Gundih and Semarang, though change of trains is necessary, owing to change of gauge.
Netherlands India Surakarta-Boyoalali. Railway Co.	18	3. 6	—	—	—	1,109,048	27,130	Engines, carriages, and trucks included in Jokyakarta-Willem I and Gundik-Surabaya lines. Boyolali terminus, alt. 1,285 ft. is starting-point for ascent of Mt. Merapi.
Netherlands India Batavia-Meester Cornelis-Kampang Melaju.	8½	3. 7	33	11	77	8,620,140	—	Town tramway, carrying only passenger traffic: it is proposed to electrify the line.
Semarang-Juwana and Steam Tram Co. branches.	249½	3. 6	36	167	1,119	8,732,735	596,749	It is proposed to electrify the town portion of the line, and enlarge it.
East Java Steam Tram Co. Surabaya-Sepanjang-Krian and Mojokerto-Ngara-Dinaya.	50	3. 6	29	118	60	9,159,809	127,002	Goods traffic only on the Mojokerto-Ngara-Dinaya line. Surabaya-Krian is a town tramway, carrying passengers only: it is proposed to electrify this line.

Serayudal Steam Tram Co.	Maos-Banjarnegara, with branch Banjarsari-Pur- balingga.	57	3. 6	14	149	31	1,646,441	165,623	
Semarang-Cheribon-Ka- bon Steam Tram Co.	Semarang-Cheribon-Ka- tipaten, with branches Tegal-Balapulang and Weleri-Besokor.	207	3. 6	74	1,036	136	4,605,609	682,964	Forms an important link between Batavia and So- marang along north coast. By express trains con- necting with those on railway journey is com- pleted in one day. Sugar traffic the most important.
Kediri Steam Tram Co.	Jombang-Kediri, with branches	76	3. 6	19	201	22	1,656,398	281,952	
Malang Steam Tram Co.	Singasari-Malang-Gon- danglegi-Dampit, with branch.	54	3. 6	15	132	17	1,345,863	181,881	
Pasuruan Steam Tram Co.	Pasuruan-Bekasi, with branch to Sengon.	28½	3. 6	12	155	26	1,216,943	187,624	
Probolinggo Steam Tram Co.	Probolinggo-Paiton, with branch Kraksaan-Kali- buntu.	28	3. 6	13	156	36	595,992	126,524	
Mojokerto Steam Tram Co.	Mojokerto-Porong, with branches.	50	3. 6	12	92	16	1,253,145	151,088	
Madura Steam Tram Co.	Kamal-Kalianget.	145	3. 6	33	354	37	1,348,592	159,272	
Babat-Jombang Steam Tram Co.	Babat-Jombang.	42	3. 6	10	86	12	630,348	101,629	Forms a link between the State Railway and the Gundik-Surabaya tram- way.
	Chikampek-Chilamaya & Chikampek-Wadas.	27	2. 0	6	51	30	671,531	38,575	
	Rambipuji-Pugar.	25	2. 0	6	39	14	445,739	18,743	
Batavia Electric Tramway Co.	Harmonie-Chikini-Upper town. Harmonie-Kon- ingsplein-Menteng. Har- monie-Koningsplein- Willemslaan-Vrijmetse- laars Road.	11	3. 10½	27 (motors)		27	6,997,960	—	Town tramway : passen- ger traffic only.

purposes to connect the fortress of Willem I with the railway system, and after the garrison of the fortress was reduced the traffic declined largely, but since Willem I was made the junction for the Jokya-Willem I tramway, thus bringing the Kedu Residency in connexion with the railway system, traffic has again greatly increased. The starting point of the line at Kedungjati is 118 ft. above sea-level, and the terminus 1,554 ft. The differences in level to be negotiated were considerable; the gauge is the narrower one of the State Railway, and the curves have a smaller radius, making the use of the rolling-stock of the Semarang-Jokyakarta line impossible. The bridges and culverts total 656 ft. in length, the largest span being 92 ft.

The Netherlands India Railway has a total length of 128 miles, with 34 stations and halts. It had 58 engines, 112 carriages, 26 luggage-vans, and 1,326 trucks. In 1914 it carried 3,351,706 passengers, of whom less than 1 per cent. were first class and 2 per cent. were second class, and 798,000 tons of goods; its total receipts were £430,175, and its net profits £187,428. The engines are divided into broad gauge and narrow gauge. The older broad gauge locomotives are 0-4-2, with inside cylinders, and the newer 4-6-0; they are used for main line trains between Jokyakarta and Semarang. The narrow gauge engines are principally 2-6-2 tank engines, used on the main line and on the Jokyakarta-Magelang tramway; they have a very high-pitched appearance.

Tramways of Java

The steam tramways of Java, which are private undertakings, play an important part in the through traffic; they serve as links where the construction and exploitation of railways would be a difficult matter, since it is possible for a tramway to pay interest on the capital employed in its construction with a very small daily profit. They are railways of a simplified type, running as far as possible along the side of roads, though they sometimes take short cuts across country. They are thus cheap to build, but can never attain a high speed, though a maximum of about 28 miles an hour is now allowed where the trams do not run along the road, and they sometimes run 'fast' trains, i. e. trains not stopping at all stations. The stations and halts are similar to those on the

railways. The total length of the steam tramways is some 1,320 miles. The total cost of running was £665,000, and the net profits £647,000. The lines belonging to the Netherlands India Railway Company paid the highest dividend in 1914, 14 per cent. With the exception of the tramways from Chikampek to Chilamaya, and from Batavia to Meester Cornelis, they have all the normal gauge of the railways, so that the same rolling-stock can be used on both systems. The table on pp. 410-411 gives a list of the tramways of Java.

OUTER POSSESSIONS

Roads

A new era in road-construction began with the establishment some years ago of a road inspectorate for the Outer Possessions, and Sumatra in particular, under the Department for Civil Public Works. Before this the initiative in road-making and mending lay with the local administration, and was carried out by statute labour. The original rude path, with its temporary bridges or primitive ferries over the rivers, was gradually widened and improved by small successive efforts, government help being sometimes forthcoming for the removal of obstacles, &c. In the course of time permanent bridges were built ; but it is often years before a road becomes fit for traffic, and even then it is apt to deteriorate very quickly. A widespread network of such roads is in existence in the Outer Possessions, but they are confined to more or less thickly populated districts where the ground does not present any very great difficulties ; they have a local, or at most a regional, character, since the native state frontier is frequently combined with a natural boundary, such as a range of mountains over which the construction of a road is a difficult matter. As a rule, the administrative centre of a country has been first connected with the surrounding centres of population, and in their turn these have been joined to the inland markets, usually situated in Sumatra and Borneo at the point where a river ceases to be navigable. From here roads are made up-stream, and later down stream, to improve communications between the coast and the interior : except in Palembang, however, this latter class of roads is mostly still non-existent in the Outer Possessions, and owing to the difficulties of construction it is only the making of the interior net-

work which has been undertaken. On the smaller islands and in Celebes, where there are practically no navigable rivers, communications consist mostly in roads between the administrative centres, which are joined to the other population centres in their turn by branches from the main roads : inter-regional traffic is badly served by this system. The obvious need of the Outer Possessions, with their increasing economic importance, of a centralized system of communications, and a general improvement in the linking up of the local and isolated road-systems, led to the establishment of the inspectorate ; and the old system of local road construction and improvement now goes on side by side with the making of new arteries of traffic.

Roads in Sumatra.—A provisional plan forming a complete though wide-meshed network over the whole of Sumatra has been prepared, and in 1913 fifteen roads were being constructed as links, as follows :

(1) *Kru-Liwa-L. Ranau-Muara Duwa* (70 miles), to join centres of population round Liwa and L. Ranau with the west coast.

(2) *Lorok Road, Palembang-Talang Anak Ayer* (15 miles) to join Palembang to the system of motor transport in operation in Upper Palembang.

(3) *Pasar Churub-Muara Aman* (44 miles), to join the Benkulen mining district with the capital.

(4) *Central Sumatra Road, Sijunjung* (Padang Highland) through the Batang Hari districts to Pulu Punjung (51 miles), to join the road-systems of Jambi and the west coast.

(5) *Muara Bungo-Muara Tebo* (27 miles), to join the road in Upper Jambi with the Batang Hari, which is only navigable to Muara Tebo.

(6) *Telok Nibung-Bungus* (6 miles) to join the road-systems of Padang and Painon.

(7) *Lubuk Bangkung-Pakan Baru* (101 miles), to join the Padang Highlands to Parit, and from there by the existing road to Pakan Baru, on the Siak, navigable by sea-going vessels to this point.

(8) *Reo-Muara Sipongi* (16 miles), to join the road-systems of the Padang Highlands and Tapanuli.

(9) *Tanah Batu-Toriola* (22 miles), to join Mandailing with the harbours of Natal.

(10) *Sibolga-Tarutung* (42 miles), to join the road system of the Toba Highlands with that of southern Tapanuli.

(11) *Narumonda-Pematang Siantar-Tebing Tinggi* (36 miles), to join the Toba and Sibolga Highlands with the east coast.

(12) *Belawan Deli-Labuan* ($2\frac{1}{2}$ miles), to join Medan with Belawan harbour.

(13) *Alas Road, Kaban Jahe-Kota Chane* (85 miles), to join the Alas country with the Karo plateau and the east coast road-system.

(14) *Gajo Road, Bireuen-Takengon* (47 miles), to join the Gajo country with the north coast.

(15) *Taratah Buluh-Simalayang* (16 miles), to join the settlements on the Kampar Kiri with the existing road Taratah Buluh-Pakanbaru, to which point the river is navigable for sea-going ships.

These roads are constructed at government expense, since the sparsely-populated nature of the country and the difficulties of construction made the use of statute labour impossible.

It was reckoned that these roads would have been entirely completed by the present time, but recent conditions have delayed the work. In 1913 numbers 8 and 14 were complete, 2, 6, 10, and 13 nearly so, and the rest in varying stages of construction. On their completion Sumatra will possess about 2,200 miles of main roads (1,700 miles metalled), and about 4,200 miles of secondary roads (550 miles metalled). Plans had also been made in 1913 for the joining by roads of Palembang and the Lampong districts, Palembang and Jambi, and Korinchi and Tapan, and the connecting of the road-systems of Benkulen and Padang, and the East Coast Residency and Aceh.

Motor Transport in Sumatra.—In 1907 a Government motor service was started in Palembang and Benkulen, where the transport of people and of goods was carried on under great difficulties. The undertaking went through a difficult period, but seems now prosperous, and showed a profit of £4,177 in 1913, the total receipts being £16,316. The service is in charge of an official who has his head-quarters at Benkulen, and is responsible to the Director of Government Industries. In 1913 there were in use fourteen motors working in Palembang, seven in Benkulen, and three 32-ton lorries for goods transport ; 20,436 passengers were carried. The service ran over a distance

of 667 miles, from Muara Enim to Blimbing, Batu Raja Padang Burnai, Pagar Alam, and Muara Klingi, with the intermediate places ; and from Benkulen to Muara Klingi (where a junction is effected with the Palembang service), Muara Aman, and Padang Guchi. From Muara Enim the service is weekly, either for goods or for mails, and from Benkulen bi-weekly, for goods and mails, except to Padang Guchi, which has only a weekly service. Since 1913 the road to Palembang from Muara Enim has been finished, and the motors have been able to run there from Blimbing. Since 1916 the mails are taken as far as Gunong Megang by rail. There is also a private line of motors running in the mining district of Benkulen, providing for goods transport only. Since 1916 the mails between Fort de Kock and Matur, Padang Sidimpunan and Sipirok, Penyabangan and Tanah Batu, and Padang Panjang and Fort van den Capellen have also been carried by the motors of the government service. A similar motor service has also been started which carries mails between Sibolga, Tarutung, and Balige.

Roads in Borneo.—Road inspection is also being begun in other parts of the Outer Possessions. In Borneo, in 1913, a survey was made for a road from Long Iram, on the Upper Mahakkan, over the northern divide with the basin of the Bulungun, where communication is up to now carried on only up the rivers where navigation is difficult, and by a bad mountain path. In Borneo, however, communications are still exceedingly imperfect. Roads which are more or less passable for horses and carts are only found quite close to the chief settlements ; apart from these, communication is carried on on foot, and is even then often rendered very difficult by the thick forest and marshes. Wherever possible the rivers are made use of, and land transport is limited to a footpath joining one river-system to the next by the most direct route, going up and down hill and through rivers and marshes. Over the most difficult streams and bogs tree-trunks are laid, but no effort to harden the track is made. Such paths are usually only broad enough for one person, and are made simply by cutting down the trees and plants : the conservative natives seldom diverge from such a line, once it is known, except when a village is moved. The roads are rather better in Apo Kayan, where water-communication is particularly bad. The Dayaks

manage to travel over the country with comparative ease, but Europeans only undertake a journey across the divides for special political or administrative reasons.

Roads in Celebes.—In Celebes a large amount of attention has been devoted to road-making by successive governors. Menado and Minahasa in particular have a good road-system, and much has been done of late years in the recently conquered part of the island. In 1917 it was decided to join the road-system of Maros with that of the coast of the Boni Gulf by means of a new road.

Roads in Other Islands.—In Bali and Lombok the prosperous population co-operates voluntarily in road construction, and shows considerable technical knowledge and aptitude. Banka and Billiton have been provided with a good road-system to facilitate transport to and from the tin mines. In 1910 there were 1,180 miles of roads in Banka fit for wheeled traffic, 298 miles kept in repair by the mining companies. All the bridges are being strengthened to allow of motor traffic, which is coming more and more into use. In the Moluccas there are roads sufficient for local needs in the smaller islands such as Amboina, Ternate, and Banda, but in the larger and less-developed islands, such as Halmaheira and Ceram, the system of communications is still in its infancy. The same may be said of the islands in the Timor Residency, but a riding-road from Kupang to Atapupu and thence southwards was in course of construction in Timor in 1912, 31 miles being finished ; and in 1917 20,000 guilders were voted for a survey on which to base a plan for road-construction in the island.

Railways in the Outer Possessions : Sumatra

Sumatra is the only island of the Outer Possessions having railway or tramway communications, with the exception of a few small private lines for transport on private estates such as those in Borneo from Balik Papan, and from the Pulu Laut mines, to the coast ; and in Sumatra there were only 209 miles of railway and 402 miles of tramway working in 1914, though plans for the exploitation of a regular railway system under government and private auspices had been drawn up.

West Coast State Railway.—The West Sumatran Railway was built to connect the coalfields at Sawah Lunto and the populous Padang Highlands with the coast and the harbour of Emma-

haven. Its financial position is not very favourable, owing to various causes—the short length of line working, the comparatively small amount of traffic, and the large increase of 3rd class passengers since the institution in 1911 of a universal charge for such travellers of about $\frac{1}{2}d.$ per mile. The returns are also largely affected by the cost of transporting coal from the government mines, for which branch of transport there are no countervailing receipts. The total receipts in 1914 were £213,745, the net profits being £84,698. The line is 152 miles long, with a gauge of 3 ft. 6 ins., and runs from Emmahaven to Fort de Kock, Solok, Muara Kalaban, and Sawah Lunto, with a branch to Lubuk Alung via Sungei Limau and Pariaman, and another from Fort de Kock to Padang Panjang and Payakombò. Two extensions from Payakombo to Padang Suliki ($15\frac{1}{2}$ miles) and Balai Panjang ($7\frac{1}{2}$ miles) are arranged, and are probably in course of construction. Considerable portions of the line are built on the rack and pinion system. In 1914 3,001,079 passengers were carried, and 638,680 tons of goods, the latter traffic being considerably the more important. There are 37 stations and halts, 68 engines, 97 carriages and luggage-vans, and 792 trucks.

Deli Railway.—The Deli Railway, which belongs to a company having a monopoly of railway construction in that part of the island, consists of 57 miles of railway and 105 miles of tramway, built to serve the growing industrial and commercial needs of East Sumatra. The line runs across flat and often marshy country, from the harbour of Belawan Deli via Medan to Deli Tua, and is continued by the tramways in all directions. In 1916 the lines had reached Pangkalan Brandan in the north, and Pematang Siantar in the south. Concessions were given in 1913 for extensions from Tebingtinggi to Tanjong Balai, from Timbang Langkat to Kualu, from Medan to Arnhemia, and from Lubu Pakan to Bangun Purba. The gauge is the normal one of 3 ft. 6 ins. There were, in 1914, 54 stations and halts on the system, of which Belawan is the chief, though Medan is the central junction for the branch lines. There were 38 engines of three classes, weighing 23, 30, and 40 tons, 139 carriages and luggage-vans, and 960 trucks: these are in use on the tramways as well as on the railways. In 1914 there were 3,079,482 passengers on the whole system, and 580,990 tons of goods were carried. The receipts were £184,802 and the net

profits £100,525 (13 per cent. on the capital outlay) on the railway, with receipts £90,199 and profits £32,663 on the tramways. There has been considerable controversy, since the rubber-boom of 1909 gave the hinterland of northern Langkat and its products an important position in the export trade, between the company owning the Deli tramway and the Aceh tramway authorities, that is to say, between those who wanted the trade to go to Belawan and those who wanted it for Aru Bay. Various plans for extending either or both lines to serve this new territory, have been proposed. The latest scheme is to join the Deli to the Aceh tramway by a line from Pangkalan Brandan to Telok Tabuhan on Aru Bay.

Acheh Steam Tramway.—This steam tramway was constructed for military and political, not for economic, purposes, and it has been gradually lengthened to keep pace with the needs of the troops occupying the country. It now runs from Kuta Raja along the north-east coast to Kuala Simpang, passing through Sigli, Bireuen, Lho Sukon, Idi, and Langsa. In 1913 permission was given for the continuation of the line from Kuala Simpang to Besitang, and also from Pangkalan Susu to Telok Tabuhan on Aru Bay, with a connexion between Pangkalan Susu and Besitang. The section between Kuala Simpang and Besitang was almost finished in 1916. This extension will give the Aceh tramway its natural terminus on Aru Bay with an accessible harbour, and will probably largely increase its economic utility, since it is intended to make Aru Bay into the port for the export of the products of Aceh, and the promoters of the plan hope to turn it into a formidable competitor of Belawan, if not of Singapore and Sabang. The gauge of the tramway is 2 ft. 6 ins. It is 293 miles long, and has 59 engines, 132 carriages and luggage-vans, and 795 trucks. In 1914 2,968,708 passengers were carried, and 119,696 tons of goods. The net profits were £6,337 (under 1 per cent. on the capital outlay), and the total receipts £76,221, the low rate of profit being explained by the political rather than financial reasons which determined the course of the line.

Railways in Construction, and Proposed Railways.—The line from Palembang to Muara Enim and Telok Betong is in course of construction, and about 141 miles were open in 1917. Work is being continued at both ends, more slowly near Telok Betong than near Palembang. It is not yet decided where the line

from Palembang to Batu Raja, and from thence to the rail-head of the Lampong line, shall run. The line to Muara Enim was open between Kartopati (Palembang) and Gunongmegang in 1916. These two lines form part of the plan to construct a complete network of railways to serve the developing and valuable districts in southern Sumatra, and ultimately to provide through railway communication from north to south of the island, with branch lines to connect up the various economic centres. These railways will traverse country as yet very largely undeveloped, and it will therefore probably be impossible that they shall be from the first paying concerns : so that the Dutch Government has undertaken their construction, instead of leaving it to private enterprise. The new line mentioned above, connecting Palembang and Telok Betong, will be of immense importance in developing the Lampong districts where river transport is lacking, especially when connected with the communication system of Java. With this in view, a branch line has been constructed from Chilegon, on the Batavia-Anyer line, to Merak, on Sunda Strait, from whence a boat will run to Oosthaven, a safe harbour some miles to the south of Telok Betong, whose harbour is unprotected. Telok Betong will be connected with Tanjong Karang and with Oosthaven by a regular motor-service. It is proposed in course of time to connect the Wai Lima country, Menggala, Muara Dua, Lontar, and Tanjong Raja to the main line by branches. For the line which is ultimately to join Muara Enim in the south to the Deli tramway in the north, there are two possible routes over the mountains—one across Kepahiang Pass to the east of Benkulen (2,510 ft.), the route taken by the motor-road, and the other over a pass up to now unused to the south-east of Benkulen, which is 2,198 ft. high at its highest point on the northern slope of Mt. Dingin : it would have various branches, and would connect with the Central Sumatran railway. This line, for which a preliminary plan had been made in 1913, is designed to provide an outlet for the important coalfields of Ombilin on the east coast, which will obviate the necessity for the long and expensive sea-journey from Emmahaven, making it difficult for the Sumatran coal to compete with that from Japan, Further India, or Australia in the coaling-stations of Singapore and Sabang. It will also provide a far better outlet to the east than Padang for the products of the interior

and the Menangkabau country. It is proposed that this line should run from Muara Kalaban on the Western State Railway to Sawah Lunto, Taluk, Gunong Sahilan, and Pakan Baru on the Siak : it will be 250 miles long, will cost about £2,281,000, and will take about eight years to build. Various other plans for completing the Sumatran network of railways have been made, but have probably, as yet, taken no practical shape.

Banka and Billiton Tramways.—In Banka there is a steam tramway, 16 miles long, at Blinyu, largely occupied in goods-traffic and tin-transport, in connexion with steamer services. In Billiton there is a steam-tram system, 27 miles in length, and a section is in construction from Merak to Mang (3 miles), as well as several other narrow-gauge lines.

CABLES

The East Indian islands are connected with each other by an extensive system of Dutch government cables, and with the outside world by the cables of the Eastern Extension Telegraph, Australasia, and China Company, and those of the German Netherlands Company. This latter company was formed to bring an end to the dependence of the Netherlands Indies for purposes of communication with Europe and the East on the cables of a British Company alone. When facilities were improved by the opening of the German line from Menado to Yap and Guam in the Carolines (and thence to Shanghai) in 1905, and by the opening of the French line from Pontianak to Saigon in 1906, the necessity for improved cable communication between the islands themselves was obvious, and energetic measures were taken, including the provision of a cable-laying ship, the *Telegraaf*.

The lines of the Eastern Extension Telegraph Company join Batavia with the Cocos Islands and Mauritius ; with Fremantle and Adelaide in Australia ; and with Singapore, and thence with Europe and the East. There is also a line from Banyuwangi (Java) to Darwin in Australia, and from Belawan (Sumatra) to Penang. The German Netherlands line, which is subsidized by the Dutch Government, provides the cheapest service to America and the French line gives communication with Indo-China. This line has been out of commission since 1914, in spite of efforts made to repair it by the *Telegraaf*.

The Dutch lines are as follows (the places mentioned are in

Java unless otherwise stated) : Batavia–Semarang–Surabaya–Balik Papan (Borneo)–Kwangdang Bay (Celebes)–Menado (Celebes). Batavia–Padang (Sumatra)–Sibolga (Sumatra). Batavia–Tanjong Pandan (Billiton)–Pangkal Pinang and Muntok (Banka)–Palembang (Sumatra). Situbondo–Banjermasin (Borneo). Situbondo – Makassar (Celebes) – Balik Papan (Borneo). Situbondo – Buleleng (Bali) – Ampenan (Lombok). Sabang (Sumatra)–Kuta Raja (Sumatra)–Belawan (Sumatra). Singkel (Sumatra)–Tapatuan (Sumatra). Singkel (Sumatra)–Simalur Island. Anjer–Telok Betong (Sumatra). Gorontalo (Celebes)–Kema (Celebes)–Ternate (Moluccas). It will be noticed that though the western islands are well supplied with cables, there are none in the eastern islands, i. e. the Moluccas, New Guinea, and the Timor group, with the exception of the line to Ternate. In 1914 172,232 messages were sent and received in Java and Madura by the Eastern Telegraph Extension Company, and 74,197 in the Outer Possessions. By the German Netherlands (Yap) line 31,072 messages were sent and received in Java and Madura, and 10,429 in the Outer Possessions, but this line has been closed to the public since the outbreak of war. A message to Europe via Yap–Kiakhta, Yap–Vladivostok, Madras–Suez, Cocos–Suez, or Madras–Teheran, costs 2 guilders 25 cents (3s. 9d.) per word. Government telegrams via Cocos cost 1 guilder 77 cents (2s. 11½d.) per word, and 4 cents more via Madras. The tariff to San Francisco via Menado–Yap–Guam is 4s. 6d. per word for ordinary messages, 1s. 5d. for press messages, and 3s. 11d. for Netherlands East Indian and German Government telegrams.

TELEGRAPHS

In 1916 there were 6,846 miles of overhead telegraph line in the East Indies : 1,179,274 telegrams were sent and received in Java, and 414,314 in the Outer Possessions ; 287,930 of the total were sent to, or received from, outside. There are no private telegraph lines except over personal property. The government lines are laid as far as possible along railways, and iron posts are extensively used where their transport does not present too great difficulties. The wires are also often affixed to trees, by preference to iron-wood or *kapok* trees. Considerable difficulty was experienced in line-construction through the Sumatran forests : the wires were frequently destroyed by

wild animals, and the natives in charge did not repair them properly, but conditions are now improved. To obviate the inconvenience of stoppage on one line, two are laid whenever possible.

In Java there are telegraph wires along all the main lines of communication.

In Sumatra in 1914, in the south, Telok Betong was joined to Palembang, Jambi, and Benkulen (with lines to Lebongsulit, Menggala, and Pageralam). There was also a line in the west from Benkulen to Mokko Mokko (with branch from Tapan to Sungaipenuh), Padang, Fort de Kock, Padang Sidimpuan, Sibolga, and Singkel. Padang is also joined to Jambi via Sawah Lunto and Muara Tembesi, and to Bangkinang via Payakombo and Kota Baru. In addition there is a line along the north-east coast from Kuta Raja via Medan to Tanjong Balai, and from thence across the island to Padang Sidimpuan, where it meets the connexion to Padang and the south.

In Celebes there is a line from Menado to Ayer Madidi and Amurang.

Borneo has telegraphic communication from Banjarmasin to Tanahgrogot, Balik Papan, and Samarinda, and from Banjarmasin to Kota Baru.

There is a 'two-circle' tariff for telegrams. Messages for a place within a radius of 46 miles cost 5 cents (1d.) per word, with a minimum of 25 cents, and for a longer distance they cost 10 cents per word, with a minimum of 50 cents. These charges are increased by 5 cents a word (minimum 25 cents) for places connected by cables of 46 miles or less, and by 10 cents (minimum 50 cents) for places connected by cable for a greater distance. This does not apply to the cable between Java and Madura. One-fifth of the ordinary inland rate is charged for press telegrams. The service is often delayed by these and the numerous government messages. A deferred telegram service is in operation at reduced rates and is very largely used. Special tariffs are in force for the private railway telegraph offices.

WIRELESS TELEGRAPHY

There are four government wireless stations in the East Indies at Situbondo (Java), Sabang (Sumatra), Kupang (Timor) and Amboina (Moluccas). There is also a station at Welte-

wreden, worked by the Naval Department, and private stations at Balik Papan and Tarakan (Borneo), belonging to the Royal Dutch Petroleum Company, and used for private messages and for communicating with the ships of the Royal Packet Company. The Government can take over these private installations at any time, without compensation, in time of war. The stations at Amboina and Kupang, which were opened in 1914, will assist the Moluccan trade, since quick communication with Java will be possible to ascertain the market fluctuations, and they will also be of great use to the Makassar business houses interested in the Moluccas trade. The Sabang station is of more use for navigation than for trading purposes. In 1913 it was in communication with 3,809 ships, and exchanged messages with 737 of them. The large majority of the messages dealt with by the stations were coming from or going to the other East Indian stations or those of the Straits Settlements and Malay States. Communication has been found much more difficult during the wet monsoon, i. e. from November to March, and is then almost impossible during the middle of the day. Messages are sent as far as possible between 7 and 8 a.m. and between 1.30 and 7 p.m., but since the war the stations have been directed to listen for ships' messages night and day. Messages are sent free, at sender's own risk.

<i>Station.</i>	<i>Call signal.</i>	<i>Normal wave-length, metres.</i>	<i>Normal range, nautical miles.</i>
Amboina	PKE	600	420
Balikpapan	—	—	—
Kupang	PKD	600	420
Sabang	PKA	600	Day: 400 Night: 800
Situbondo	PKC	600	—
Tarakan	—	—	—
Weltevreden	PKB	600	270

TELEPHONES

The telephone system in Java is well developed, and follows in general the network of railways, main roads, and telegraphs. Most of the larger towns have urban systems, which are connected by inter-urban lines, the chief of which run, one along the north coast (Batavia-Semarang-Surabaya), and the other more to the south (Anyer Lor-Batavia-Buiten-

zorg - Padalarang - Jokyakarta - Surakarta - Jombang - Surabaya - Pasuruan - Probolinggo). Private telephones were formerly numerous, but by 1916 there were only eleven concessions still in force, consisting mostly of small and unimportant plants, and the telephones on the Semarang-Juwana and Madura steam tramways, which are used by the public. Practically the whole system in Java is thus in the hands of the Government, and the regulations and tariffs are uniform. Both the revenue and the number of telephones have increased largely in recent years, and the system is now really an extension of the telegraph system, since telegraphic messages are largely transmitted by telephone.

In the Outer Possessions such telephone lines as exist are also mostly in the hands of the Government, though there are private systems in the Padang Highlands, in Makassar, and from Pontianak to Banjarmasin, in Borneo.

There are local installations in many of the provincial capitals of Sumatra, and a considerable length of line used for military and administrative purposes, and to a limited extent by the public; but the inter-urban system is very little developed. In 1914 only certain places in the interior of Jambi, Palembang, Riouw, and Sumatra East Coast were connected by telephone, the lines running from Tebing Tinggi (Palembang) to Sarolangan, Muara Tembesi, on the Siak, Muara Bungo, with a branch to Sungaipenuh; also from Rengat (Riouw) to Pasir Pengarayan (Sumatra East Coast) via Taluk and Bangkinang. There are in addition short lines, connecting Singaraja and Den Pasar, Palembang and Sekayu, Padang Panjang and Bon, and Singkel and Trumon.

In 1916 the following places possessed local or district telephone systems (they are in Java unless otherwise stated): Amboina (Amboina), Ampenan (Lombok), Bandung, Banggil, Banjar, Banjarmasin (Borneo), Batavia, Benkulen (Sumatra), Blitar, Blora, Bojonegoro, Bondowoso, Chepu, Chianjur, Chilachap, Den Pasar (Bali), Garut, Gorontalo (Celebes), Jambi (Sumatra), Jember, Jokyakarta, Jombang, Kediri, Kendal, Kertosono, Kraksaan, Krawang, Lumajang, Madiun, Magelang, Malang, Menado (Celebes), Mojokerto, Palembang (Sumatra), Pamekasan, Pandeglang, Pasuruan, Pontianak (Borneo), Probolinggo, Purwakarta, Rangkasbitong, Rembang, Salatiga, Semarang, Serang, Sidoarjo, Singaraja (Bali), Situbondo, Sukabumi,

Sumenep, Surabaya, Surakarta, Tasikmalaya, Telok Betong (Sumatra). Many of these places have also dependent systems in neighbouring towns, connected with the central urban system, e. g. the telephone system at Jokyakarta includes dependent systems at Kalasan, Palbapang, Sentolo, Sleman, and Wonosari.

POSTAL ARRANGEMENTS

The mails in the East Indies were carried in 1916 over a distance of 3,327 miles in Java, and 6,549 miles in the Outer Possessions. In Java they go mostly by rail, but there is a motor-mail service between Tanjong Priok and Batavia. Horses are used in parts of Batavia Residency, Cheribon Residency, and the Preanger Regencies, and for 198 miles they are carried on foot. In the Outer Possessions they are carried for a distance of 1,919 miles on foot, for 1,115 miles by boat, 1,455 miles by motor, and the rest of the way by rail, cart, or on horseback. Over 781 miles there is a post once or more each day, over 4,706 miles from one to six times a week, and at longer intervals over the rest of the distance. All the posts in Java and Madura are delivered at least six times a week. In Java, in addition to the post offices and sub-post offices (see table), there is the *ambulante* postal service on the railways, in which the guard of the train carries mails to and from those places which have no post office, and stamps are sold at the station. There are travelling post office vans between various places, and in 1914 letters took 36 hours to go from Batavia to Surabaya. In the Outer Possessions the mail is not always yet free from the danger of attack by natives or wild animals. Delivery is made by natives, under European supervision. In 1914 a total number of 17,789,681 letters was sent by inland post, (5,252,800 being post free), 5,779,020 post cards, 19,888,609 newspapers and circulars, 290,641 samples, and 983,827 communications under other heads. Letter-postage is 10 cents for each 20 grammes (about 2*d.* for $\frac{3}{4}$ oz.), in the East Indies or by the sea-route to Holland, and 7 $\frac{1}{2}$ cents (1 $\frac{1}{2}$ *d.*) for each successive 20 grammes. A letter to Holland by the land route, or to other countries, in the Postal Union costs 12 $\frac{1}{2}$ cents (2 $\frac{1}{2}$ *d.*), and to non-union countries 37 $\frac{1}{2}$ cents (7 $\frac{1}{2}$ *d.*). A reduced tariff is in force for soldiers. Newspapers cost $\frac{1}{2}$ cent for 25 grammes ; printed matter, samples,

&c., 1 cent for 50 grammes (under $\frac{1}{4}d.$ for $1\frac{3}{4}$ oz.), with a minimum of 5 cents ($1d.$) for printed matter, and $2\frac{1}{2}$ cents ($\frac{1}{2}d.$) for samples. Post cards cost 5 cents ($1d.$). Parcels in Java cost 30 cents ($6d.$), 50 cents ($10d.$), and 70 cents ($1s. 2d.$) for 1, 3 and 5 kilogrammes (about 2 lb. 3 oz., 6 lb. 14 oz., and 11 lb.); from Java to the Outer Possessions, and in the latter between places not connected by rail, the charge is 60 cents ($1s.$) for 1 kilogramme, 100 cents ($1s. 6d.$) for 3 kilogrammes, and 1 guilder, 25 cents ($2s. 1d.$) for 5 kilogrammes, the latter weight being the maximum.

The following table gives numbers and particulars of the post, telegraph, and telephone offices in the East Indies; the sub-telegraph offices are those in which messages are taken and sent by telephone.

<i>Description of Offices.</i>	<i>Java and Madura.</i>	<i>Sumatra.</i>	<i>Borneo.</i>	<i>Celebes.</i>	<i>Other Islands.</i>	<i>Total.</i>
GOVERNMENT						
Post and telegraph offices	105	50	7	3	13	172
Post offices where there are also S. Celebes military telephones	—	—	—	3	—	3
Other post offices	—	1	1	—	3	5
Wireless stations	2	—	—	—	3	5
Sub-post offices where there are :						
Sub-telegraph offices	18	14	1	4	4	41
Railway telegraph offices	57	6	—	—	—	63
Offices of S. Celebes military telephone system	—	—	—	4	—	4
Offices of S. Celebes civil telephone system	—	—	—	3	—	3
Other sub-post offices	37	45	16	19	38	155
Sub-telegraph offices with no assistant post office	—	1	—	—	3	4
Railway and tramway telegraphs with forwarding offices	237	30	—	—	—	267
Railway telegraph office with no postal service	1	—	—	—	—	1
Offices of S. Celebes military telephone system with no sub-post office	—	—	—	11	—	11
Offices of S. Celebes civil telephone system with no sub-post office	—	—	—	5	—	5
Telephone offices of Inland Administration	—	15	6	—	5	26
Total number of State offices	457	162	31	52	69	765
PRIVATE						
Railway telegraph offices ¹	54	14	—	—	—	68
Telephone offices ²	36	—	—	—	—	36
Total number of offices	547	176	31	52	69	869

¹ Forty-nine belong to the Netherlands India Railway Co., fourteen to the Deli Tramway Co., and three to the Semarang-Cheribon Steam Tram Co. At fourteen of these places there are also State telegraph offices.

² Seventeen belong to the Semarang-Juwana Steam Tram Co., and thirteen to the Madura Steam Tram Co. At five of these places there are also State telegraph offices.

Post Office Savings Bank.—In 1914 a total of £627,749 was paid into the East Indian Post Office Savings Bank, and £710,959 was withdrawn, thus giving an adverse balance of £23,210, but the undertaking shows a credit balance of £605,747 during the period between 1898 (when it was started) and 1914. In the latter year there were 104,328 European, 90,348 native, and 9,104 foreign Oriental depositors. At the end of the year a large number of depositors (80,604) had a balance of under 10 guilders (16s. 8d.).

CHAPTER XIV

HISTORY

I.—FROM EARLY TIMES TO THE DUTCH RESTORATION, 1814-18

Hindus in Java—Rise of Mohammedanism—Europeans in the archipelago—Dutch and English East India Companies—Political situation, end of sixteenth century—Dutch monopolistic policy—The Dutch East India Company, to 1798—The Commission of 1803—Daendels' Governor-Generalship—Administrative reforms of Daendels—British conquest of Java, 1811—British occupation: Thomas Stamford Raffles—Native princes under the British occupation—Raffles' régime outside Java—British reform of administration in Java—Restoration of the Dutch colonies.

HINDUS IN JAVA

THE history of the region now known as Netherlands India has from the earliest times had its centre in Java, and it begins with the establishment of a Hindu civilization in that island. When the first Hindu colonists arrived cannot be definitely ascertained, but it is conjectured that commercial relations between India and Java existed at the beginning of the Christian era. From the fact that remains—the splendid architectural remains for which the island is remarkable—are more numerous in East and Central Java it may be assumed that it was in these regions that traders and political adventurers from India first gained a footing. It is true, however, that among the few remains in the west is the oldest stone, bearing the date 654. But either because of the hostility of the natives of the Sunda lands (as the districts in the west were originally called in contradistinction to the land of Java), or through the unhealthy conditions prevailing in the lowlands of Bantam and Jacatra, the first colonists were diverted to the eastern half of the island. The civilizing influence of the Hindus abolished many of the outward appearances of savagery, promoted social order, introduced a flourishing art and industry, and established a political society of great power.

The island kept in touch with the religious life of India, and the remains attest the contemporaneous existence of both

Sivaism and Buddhism, although the former, probably, was the first to arrive. In one form or the other the Hindu religious ideas were eventually adopted by the natives practically throughout the island. The latter were first placed in the lowest caste of the Sudras, and became socially and politically sharply divided off from their Hindu conquerors. On the broad basis of some form of agricultural organization, possibly the village community, there was imposed a feudal superstructure. The suzerain prince exercised direct sway over only a small tract of territory, but, as far as he was able, he compelled the attendance of his vassals at his Court. This involved constant warfare and also the passing of political supremacy from one dynasty to another. The history of Java of this period, as far as it can be relied on, tends to follow the transition of the suzerainty from one important state to another, but this does not exclude the strong probability of the existence, contemporaneously with the suzerain state, of numerous other kingdoms of importance.

Wars and the rise and fall of kingdoms did not prevent Java from becoming economically prosperous, and the Hindus are reputed to have improved the rice culture, to have introduced new cultures, and to have carried on the industries of spinning, weaving, and metal working, and a brisk shipping trade which took them as far as China and India. The Portuguese found the Javanese colony at Malacca so strong that it had a government and a political status of its own.

From inscriptions, Chinese sources, and native chronicles it is to be gathered that the first Hindu settlement in Java took place in the first century of the Christian era, and from that time onwards powerful kingdoms were formed chiefly in Central Java and the Solo valley. One kingdom only of note, Payayaran, was founded in Western Java. What is now the Residency of Surabaya was the seat of the greatest of Hindu kingdoms, Majapahit, which with the assistance of Chinese forces under Mongol generals was founded about 1295. The rulers of Majapahit extended their sway not only over all Java proper but also beyond the seas to the Malay states in Borneo, Sumatra, and the Malay Peninsula, and to Bali. The remains of the Majapahit capital, the royal residential quarter, the palaces, baths, and waterworks, give an impression of the great size and splendour of the last of the great Hindu Kingdoms in

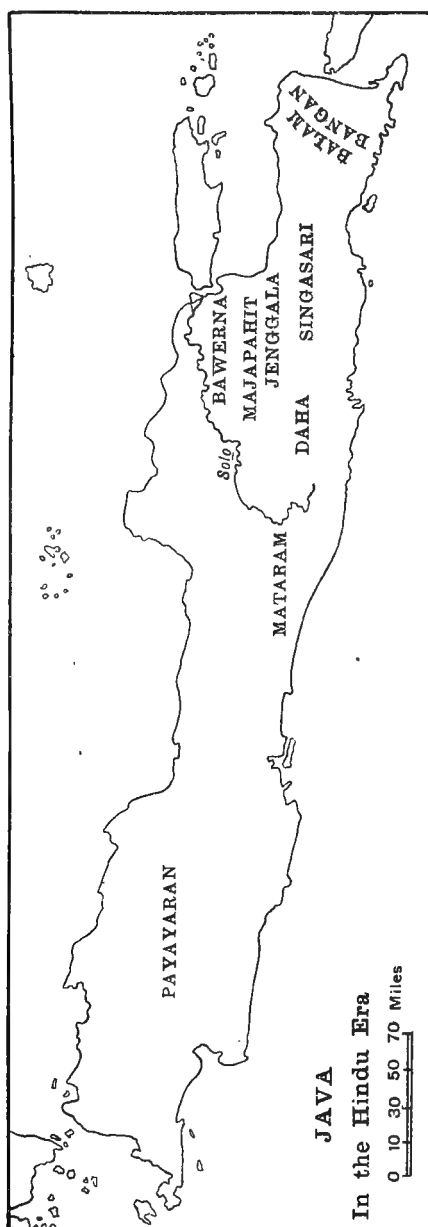


FIG. 3. Java in the Hindu Era.

Java. Intercourse with China seems to have been frequent, and in the fourteenth century colonies of Chinese merchants existed in Grisee, Tuban, and Surabaya.

RISE OF MOHAMMEDANISM

Although Islam did not become a political force in Java until about A. D. 1400 it probably made its first appearance in the Malay Archipelago as early as the ninth century. At that time there were already in existence Arab colonies in Chinese ports, and a revolt which broke out in China in the latter part of the century had the effect of diverting Arab commerce, among other places, to Palembang. Here Islam made its first Javanese converts.

There is no evidence of any important development of the Mohammedan movement in Java until the end of the fourteenth century, when the government of a number of vassal states of Majapahit fell into the hands either of Arab adventurers or of Hindu converts to Islam. The Arabs seem to have been men of enterprise and intelligence much superior to the Hindu-Javanese, and besides possessing a greater capacity for administration, they obtained, through their religious fanaticism, the reputation of possessing supernatural powers. These qualities impressed the local rajahs into whose families the Arabs married, and whose government in many cases they usurped.

An early apostle of Islam was Raden Rachmat, of Arab descent, whose uncle by marriage was the reigning prince of Majapahit. One account states that Rachmat converted his uncle, who became in secret a Mohammedan. Rachmat was granted the fief of Ampel and was the first Javanese ruler to bear the Mohammedan title of *susuhunan*. Another Arab, Mulana Ishak, came to Ampel, now the head-quarters of Mohammedanism in Java, and then proceeded to Balambangan where he effected a supposed miraculous cure of the daughter of the local prince, and eventually married her. Their son, Raden Paku, built a mosque at Giri and, at the same time, acquired a political influence so great that, after the death of Rachmat, he succeeded to the sovereignty of Ampel and Grisee. In this way he became the founder of the spiritual power of the priest-princes of Giri and acquired the status of 'pope' of the Javanese Mohammedans. A son of Rachmat settled in Rem-

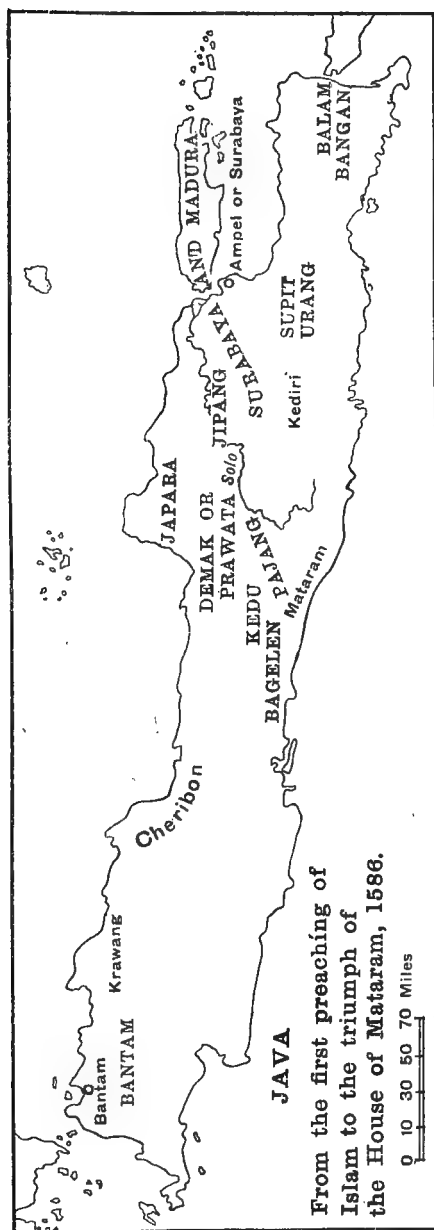


FIG. 4. Java from the first preaching of Islam to 1586.

bang, and his brother became Susuhunan of Drajat in Sidayu. The most important of the Mohammedan establishments was at Demak, where Raden Patah son of Aria Damar, regent of Palembang, obtained a tract of territory as a fief of Majapahit. He received the title of *adipati* or governor.

On the death of Susuhunan Rachmat in 1467 there were eight Mohammedan chiefs in Java, including those of Giri, Bonang in Rembang, Drajat and Jati. This last-named chief is said to have converted the Sunda lands. The funeral of the Susuhunan of Ampel, it seems, was used as an opportunity of discussing the plans of a conspiracy to overthrow the suzerain state of Majapahit. There was not altogether a straight issue between Mohammedanism and Hinduism, since when war broke out in 1468 Husein, the Mohammedan brother of Raden Patah of Demak, appeared in the field as commander-in-chief of the army of Majapahit. At first the Mohammedan forces under Raden Patah were not successful, and once they were badly beaten, but the resourcefulness of this prince kept the combination together. After further preparations Majapahit fell before the Mohammedan army, and Husein was forced to come to terms with the victors. This is supposed to have happened about 1478, and at any rate not later than 1488. It cannot be supposed that the Hindu dynasty of Majapahit was at this time totally exterminated. Hindu influence, having its centre in Bali, prevailed in the extreme east of Java for several centuries after this time.

In western Java the centre of Mohammedan power was at Cheribon, where the Mohammedan chief known as Gunung Jati had established himself. His son Hasan, who had married a princess from Demak about 1526, conquered Jacatra and then moved on to Bantam, where he had little trouble in making converts.

He was equally successful in Sumatra, where the Lampong districts acknowledged his sovereignty. He made a treaty with the Rajah of Indrapura by which the Benkulen River became the boundary between their territories. His missionary campaign seems to have been favoured by a widespread revival of Mohammedan enthusiasm throughout the archipelago, combined with a general revolt against the imperial yoke of Majapahit.

On his return from Sumatra, Hasan subjugated Payayaran.

Hinduism survived in these regions, but gradually diminished until its few remaining adherents practised their religion only with the consent of the Mohammedan Sultans of Bantam.

For some time after the overthrow of Majapahit the princes of Demak were undisputed leaders of Mohammedan Java, but a division of their dominions led subsequently to war and the passing of the supremacy to the Sultans of Payang. Among their vassals were the Adipatis of Surabaya who seceded from their former overlords the princes of Madura. Towards the end of the sixteenth century the overlordship of Payang was in its turn destroyed by the rulers of the powerful vassal state of Mataram. Under Sultan Ageng of Mataram the resistance of the turbulent Adipatis of Surabaya and his allies the priest-princes of Grisee and the chiefs of Kediri was for the time being, at any rate, broken.

The Sultan now directed his attention to the State of Bantam, over which he claimed to be suzerain as the inheritor of the authority exercised over all Java by the princes of Demak. Bantam resisted this pretension and made counter claims to the overlordship of Preanger and Cheribon. For the purpose of furthering his schemes against Bantam Ageng approached the Dutch, and the subsequent history of the State is involved with Dutch activities (see below, p. 448), but it may be stated here that at his death in 1645, Sultan Ageng left the empire of Mataram at its highest point. Normally, internal dissensions would have eventually brought it to the fate which had befallen all previous empires in Java, but European influence, now beginning to make itself felt in native affairs, was destined to give a new direction to Javanese political life:

EUROPEANS IN THE ARCHIPELAGO

The Portuguese

The first European to penetrate into the East Indian Archipelago was the Venetian, Marco Polo, who in 1290 visited Sumatra. In 1323, an Italian monk, Odoric of Pordenone, arrived in Java, and about a century later another Venetian, Nicolo Conti, made a short stay in the island. The Europeans, however, who first recognized the economic possibilities of the region were the Portuguese, who through the Arabs had become acquainted with the spice trade. At the end of the fifteenth

century and the beginning of the sixteenth a series of expeditions under royal patronage made their way round the Cape of Good Hope, to the ports of India. In 1508 Alfonso d'Albuquerque dispatched to Sumatra an expedition under Sequeira, who also made a call at Malacca, the emporium of the East Indies.

Among the concourse of Oriental traders gathered there were numerous Javanese, who formed two large self-governing colonies under the supreme authority of the local Malay Sultan. It was with their help that Albuquerque in 1510, with a fleet of nineteen ships, succeeded in making himself master of the town. This conquest caused much consternation among those nations which had hitherto divided among them the East Indian trade, and many attempts were made to expel the interlopers. The dispossessed Sultan and his allies from Bantam made the first essay, the Javanese from East Java made three attempts, and the Sultan of Achin in Sumatra no less than seven. The Portuguese, however, successfully resisted these attacks until the town was ultimately captured by the Dutch, in 1641.

Meanwhile the Portuguese lost no time in gaining their second objective, the Moluccas. In the same year that Malacca was taken, Antonio d'Abreu reached Amboina and brought back a cargo of cloves. By 1521 the Portuguese had established themselves at Ternate, Tidore, and Banda. At the two first places they were well received, but were soon at enmity with the local rulers, one of whom, the King of Tidore, had his capital destroyed.

The first governors of the Moluccas, who held their office subject to the authority of the Viceroy of Portuguese India, were notorious for their high-handed proceedings, and for their cruel treatment of the native rulers. During the régime of Menezes, civil war broke out among the Portuguese themselves. The acts of one of the worst governors, D'Ataïda (1530), resulted in the formation of a formidable league of Moluccan chiefs, who massacred many Europeans and by a stringent blockade almost reduced the garrison at Ternate. The advent of Antonio Galvan in 1536 somewhat relieved the situation, and after defeating the Moluccan allies in battle, he adopted a conciliatory policy towards the natives. He also inaugurated a missionary movement which made several converts, and was revived later. However, the natives who were more deeply interested in the control of the spice trade—the Javanese,

Makassarese, and Bandanese—made a formidable attempt in 1537 to destroy their European rivals, but were signally defeated in a naval engagement.

The beneficent rule of Galvan provided only a temporary relief for the natives of the Moluccas, and after his departure the old policy of ruthless repression was again adopted by the Portuguese governors. Intermittent warfare now ensued in Ternate and Tidore, and in 1581 the Portuguese were driven out of the former island.

The Spanish

After Magellan's passage round Cape Horn to the Far East, the Spanish had laid claim to the Moluccas under the Treaty of Tordesillas (1494), and reinforcements soon arrived to enforce their pretensions. In 1528, however, they were bought out and their sphere of activity was relegated to a region well east of the Spice Islands. When in 1580 Portugal was incorporated in Spain the Spaniards assumed control over operations in the Moluccas, which they directed from their settlements in the Philippines. Several expeditions attempted to reduce the Moluccas, but without success until, in 1606, Ternate and Tidore were recaptured and their rulers deported.

The English

In 1579 Sir Francis Drake arrived at Ternate and Bantam, and in 1587 he was followed by Thomas Cavendish. The defeat of the Spanish Armada inspired English sailors with greater daring, and a fleet of three vessels was fitted out under Lancaster. In 1591 the one vessel surviving reached Sumatra and created an unfavourable impression among the natives by plundering Portuguese ships in the Straits of Malacca.

The Dutch

The nation which reaped the fullest benefit from the defeat of the Armada was the Dutch. Before the incorporation of Portugal in Spain, they had acted as middlemen for the distribution in central European markets of the spice cargoes which the Portuguese brought to Lisbon. With the ascendancy of the Spanish in Portugal, this trade had been prohibited, and Dutch merchants were faced with ruin. The defeat of the Armada, however, opened up the direct route to the East,

and the Dutch with their special knowledge of the commercial possibilities and methods of the East Indian trade soon made use of their opportunity. A company was formed by Amsterdam merchants, and in April 1595 a fleet of four vessels under Cornelis Houtman set out, and after a call at Bantam and a cruise along the coast of Java, the expedition arrived back at Texel in August 1597. A second expedition which sailed in May 1598 made a more profitable voyage and established a connexion with the Moluccas. The success of these first ventures caused considerable excitement in Holland, and many companies were formed for the purpose of exploiting the trade in the Indies.

DUTCH AND ENGLISH EAST INDIA COMPANIES

In 1602 the States-General itself took up the matter and convened a meeting of the directors of the various enterprises, when it was decided to amalgamate them into one association to be known as the Dutch East India Company. From the very first, therefore, the Dutch Company bore a national character, and entered the struggle for the monopoly of the spice trade with all the prestige and resources of the State behind it.

In contrast with the Dutch, the English East India Company was a private enterprise, relying on its own comparatively small resources and conscious that it would receive little support from the State. Its expeditions were fewer in number, its fleets not so strong or well-equipped, and its merchants were in every sense adventurers, picking up a cargo and establishing a factory wherever opportunity offered. They were dependent for trade on the caprice of the native princes with whom they came in contact ; often they were compelled to shift the sites of their factories or submit to extortionate exactions, and generally they could not hope for a stable and increasing commerce. The Company's authorities at home instructed their servants in the East to avoid friction with both European and native, and at the same time to maintain their right to a free trade. Conditions being what they were it was found impossible to keep the peace either with the Europeans or the natives, and as the military strength of the Company was feeble, its trade suffered accordingly.

POLITICAL SITUATION, END OF SIXTEENTH CENTURY

The political and general strategic situation which existed in the Indies at the time of the arrival of the English and Dutch is worthy of a brief description. The direct route into the archipelago from the western side was commanded by the Portuguese in Malacca, and the shipping of rival powers was constrained to keep to the west of Sumatra and make its entry through the Sunda Strait. This circumstance made the port of Bantam important to the English and Dutch, and it was there they made their first head-quarters. This port possessed a further advantage in that it was ruled by a Sultan powerful enough to vindicate his authority in disputes between the rival European traders, and in particular to secure the English and Dutch against Portuguese aggression. This was also true of the Sultan of Makassar in Celebes, who himself possessed a considerable interest in the spice trade. In the Spice Islands themselves the political conditions were different. Here the native chiefs were not so strong, and in the northern group the Portuguese had originally possessed themselves of much of the political power nominally exercised by the Sultan of Ternate over his dependencies in that region. In the southern groups the Portuguese had not made much headway, and there was offered a favourable field for the enterprise of rivals. What Portuguese influence still remained in the Moluccas was now exercised by the Spanish Governor of the Philippines. It is also necessary to remember that the East Indies was only a part of a wide area of commercial activity, embracing, in the west, continental India where the English, Dutch, and Portuguese all had settlements, and in the north China and Japan, with which countries the three European Powers had entered into commercial relations.

The main objective of the English and Dutch was the Moluccas, and political conditions in that region were favourable to an attack on the Portuguese spice monopoly. The Portuguese policy of almost unrelieved ruthlessness had so embittered the Moluccan natives that everywhere there was a disposition to welcome their enemies. Especially was this so in the southern group, where the Portuguese had made little impression. As early as 1600, treaties for the supply of cloves and of mutual defence were concluded by the Dutch with the local chief of Amboina, and in the following year a Spanish fleet was met off

Banda and defeated. A check was experienced in 1606 in Ternate and Tidore, but a treaty of the following year arranged for a Dutch protectorate in Ternate. As compensation for their services against the Spaniards and the Portuguese the Dutch were to receive the entire clove product of the island.

This treaty is also interesting as affording a glimpse of Dutch policy in the East. It was agreed that the Dutch should support the pretensions of the Sultan of Ternate to a suzerainty over various islands in both groups of the Moluccas and even territories in Celebes. This is typical of a general policy which in relations with native States aimed at the erection of a single stable authority with whom it would be possible to enter into contracts with some guarantee of their fulfilment. Thus in 1609 when the question arose of the price to be paid for cloves to the chief of Hitu in Amboina, it was agreed to refer the matter to the arbitration of their overlord the Sultan of Ternate. The policy of 'divide and rule', so often ascribed to the Dutch in their dealings with the natives, is only true of them when on the defensive. Faction or other insecurity in native politics meant civil war and a change of government, with the consequent repudiation of contracts and a state of affairs in which it was impossible to pursue a prosperous trade.

The early fighting in the Moluccas resulted in the Dutch gaining a firm foothold in Amboina and Banda, besides securing the ascendancy in the old Portuguese head-quarters at Ternate. Tidore continued in Spanish possession for some time. Meanwhile, in concert with the Sultan of Achin, the Dutch made various attacks on Malacca, and while they were unsuccessful in their main object they badly damaged a fleet sent in 1606 by the Portuguese Viceroy of India to the relief of the city. In 1608 an armistice between Portugal and the Netherlands was signed, and this arranged for a cessation of hostilities for twelve years.

The English, meanwhile, were not neglecting the opportunity to some degree made for them by the Dutch. The traders of the two nations, when they were as yet weak in the Indies, tended to make common cause against the powerful commercial interest of Spain and Portugal. The peace concluded by King James with Spain in 1604, together with the disinclination of the English Company to incur the charges of an organized warfare, practically made the English merchants

spectators of the Dutch struggle with the Portuguese, and later with the Moluccan natives. In 1611 the exactions of the native Governor of Bantam had induced the Dutch to arrange for the establishment of new head-quarters at Jacatra, then ruled by a vassal of Bantam. By this time they had established many posts in the southern group of the Moluccas, at the chief of which, in the Amboina group, they possessed four factories and one fort.

DUTCH MONOPOLISTIC POLICY

The Dutch policy of monopoly became more manifest, and it was evident that it was directed as much against the English as the Portuguese. This policy bore heavily not only on European and Oriental trade rivals, but on the Moluccan natives themselves. These had been accustomed to secure many of the necessities of life from the Javanese, Makassarese, Chinese, and merchants of Gujarat, but under the monopolistic régime they had to accept what they could get from the Dutch. This condition of affairs provoked considerable discontent in Amboina and Banda. The Bandanese especially were by no means ready to submit without a struggle, and they were a constant menace to the Dutch garrison on Banda Neira. In 1614 they revolted, but the rising was suppressed.

Various attempts to defeat the Dutch monopolistic policy, and to establish an independent post in the Banda Islands, were made by the English between the years 1614 and 1619, but without success. An attempt at co-operation at the new Dutch head-quarters at Jacatra and in the Moluccas only accentuated differences, and for all practical purposes broke down with the massacre of Amboina (1623). This notorious incident followed upon a native revolt in Run and in Ceram, which had been ruthlessly suppressed by the Dutch. The English were accused, possibly with justification, of abetting the rebels, and in Dutch minds the suspicion arose that the English had allied with the native chiefs with a view of expelling the Dutch altogether. In Amboina the staff of the English Company was accused, in 1623, of conspiring with Japanese soldiers to seize the Dutch fort. By means of torture a confession of guilt was extorted from the prisoners, and, with one or two exceptions, the whole staff was condemned and executed.

Eventually the English were compelled to restrict their trade

to places like Bantam, Makassar, Achin, and Jambi, where they enjoyed the protection of native princes. The Portuguese and others were driven to adopt a similar expedient, and by the middle of the seventeenth century the Dutch were left with a commercial field clear of all European competition.

THE DUTCH EAST INDIA COMPANY, TO 1798

Political Activities

During this period the Dutch were also becoming involved in the politics of the native States of the archipelago. That the Company had foreseen the possibility of activities in a political capacity can be gathered from their constitution, by which they were authorized to build forts, recruit soldiers, and conclude treaties. At first their executive authority rested with the Admiral of the Fleet, but as early as 1609 a Governor-General, assisted by a Council for the Indies, was appointed to administer the affairs of the Company in the East. As communication with Holland was not at that time easy it can be seen that enormous power would soon devolve on the local executive, whose functions under the masterful Koen tended to be concentrated in the hands of the Governor-General. It has already been noted that while the directors at Amsterdam desired a peaceful policy towards the English their instructions, through stress of circumstances, were ignored by the officials in the East. In the same way Koen, in opposition to a policy of peace towards native States, urged the necessity of securing and promoting the Company's interests by means of war. The explanation of the Company's political policy is almost invariably to be found in a consideration of their economic interests, and their political problems can thus be divided conveniently into two ; the first of which is that connected with the spice trade ; the second, that involved in the economic exploitation of Java.

Relations with the Moluccas : Makassar, Ternate, &c.

The first problem, that of the spice trade, is concerned with the establishment of Dutch political ascendancy in the Spice Islands themselves. One aspect of this, the destruction of European competition, has already been treated. It now remains to give an account of the Dutch relations with the

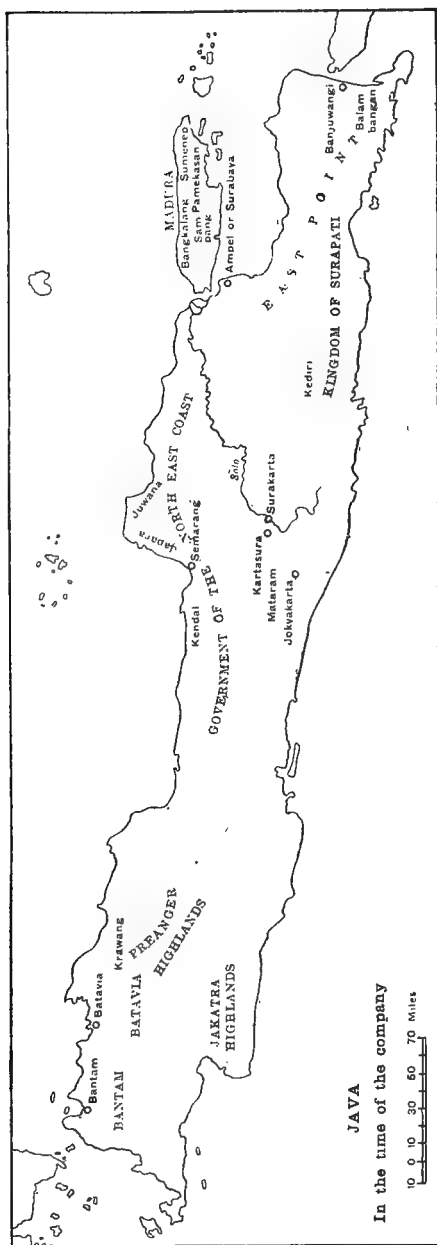


Fig. 5. Java in the time of the Company.

Molucca islanders themselves and with the State of Makassar in Celebes, whose influence in Moluccan politics was considerable.

The general dislike of the Spaniards and Portuguese ensured a favourable reception for the Dutch on their arrival in the Moluccas. Their first tactics were to ally themselves with the Sultan of Ternate, and their policy was to defend him against the Spaniards against whom he was in revolt, and enforce his claim to suzerainty over various islands in the Moluccas. The object of this policy was to erect a single authority with whom the Company could contract for the whole of the spice crop. On paper this was a comfortable arrangement, but in practice it entailed constant fighting and the renewal of treaties. Apart from the wavering loyalty of the Sultan himself there remained the difficulty of enforcing his authority throughout his widely-scattered empire.

From the numerous treaties between the natives and the Dutch it can be gathered that the Sultan exercised a feudal suzerainty over several islands in the northern groups of the Moluccas besides the rajahs and chiefs of the northern arm of Celebes, in the Sula group and in some parts of Halmaheira. In the south the Sultan's viceroy, or *kimelaha*, administered territories which appear to have been conquests partly of Ternate and partly of the Dutch, who for convenience ceded them to the Sultan. These included Ceram, Amboina, Buru, and Ambelau, other smaller islands being added at intervals. The Bandanese at first maintained their independence, as did the Tidorese, with Spanish help, in the north. Two other islands in the same chain as Tidore and Ternate, Bachian and Machian, were also independent. This chain of islands seems to have been for many centuries the centre of political power in the Moluccas. They were also, under the Portuguese, the chief place for the export of spices.

The strong political position of the North Moluccan States, however, was an obstacle in the way of the Dutch plan of complete control of the spice trade. Local Sultans were liable to break their contracts and the native Government prevented any strict supervision of the spice cultivation. In consequence, Dutch commerce gravitated to the southern groups of Banda, Amboina, and Ceram. Over these regions the authority exercised by the *kimelaha* (viceroy) on behalf of the Sultan of Ternate, became only nominal, all the real power being in the

hands of the Dutch ; the pretence of the Sultan's suzerainty was maintained only for the purpose of enlisting his help in case of rebellion. The seat of the Dutch Government was at Fort Victoria in Amboina, where a Lieutenant-Governor and a Council resided. The Governor's jurisdiction comprised the islands of Ceram, Buru, Ambelau, Keelang, Bena, Ceram Laut, and other small islands. His powers were at first chiefly commercial, but in 1637 we find him imposing export duties and issuing regulations concerning smuggling. In 1649 the Dutch Lieutenant-Governor was appointed viceroy of the Sultan of Ternate in place of the native *kimelaha*, and when the clove cultivation was restricted to the southern groups of the Moluccas this official became of still greater importance.

The islands of Banda—ten in number—were in a different position. They owed no allegiance to Ternate, and entered into contracts with the Dutch as free agents. The seat of the Dutch Government was at Fort Nassau on Banda Neira. The Dutch claimed that a treaty of 1609 had made them owners of the islands, but to this the natives did not agree. There was a rebellion in 1614, and later the Dutch, in 1621, proposed to the English members of the Council of Defence a joint conquest of Banda. The English declined to co-operate, and the Dutch alone proceeded to crush in the most ruthless fashion the resistance of the Bandanese. Thereafter, the islands were ruled by a Dutch Governor.

When the work of establishing their ascendancy in one form or another in all the spice-producing regions had been accomplished, and the supply of cloves, nutmegs, and other spices exclusively to the Dutch had been ensured, it was decided to restrict cultivation with the object of keeping up the price in Europe. Amboina and the Uliasser Islands were to be devoted to clove cultivation, and nutmegs were to be grown in Banda. This policy also involved the destruction of the spice trees in the northern Moluccas, and although it was intended that some measure of compensation should be granted the natives were naturally opposed to a proposal which threatened their means of livelihood. In Ternate a revolt broke out, and in time the whole of the Moluccas were affected. Behind the native movement lay the power of the Sultan of Makassar whose interests were equally imperilled. The authorities at Batavia recognized in the numerous local risings a widespread movement threaten-

ing the existence of the Company in the Spice Islands, and they dispatched every available man under De Vlaming van Oudshoorn, who was invested with the title of Superintendent Commissioner of the Three Eastern Regencies. This official not only destroyed the spice trees but cut off food supplies and deported whole populations, and, in spite of the menace of a Makassarese fleet in 1654, accomplished the conquest of Tidore. A state of war between the Dutch and Makassar, only interrupted by indecisive treaties, continued until peace was negotiated in 1669.

The Bongay Contract

The final treaty embodied the arrangement arrived at in 1667 which is known as the Bongay Contract. The Sultan abandoned his political pretensions to the Moluccas and the islands to the east of Lombok. The seaborne trade of Makassar was restricted mainly to countries westward of Celebes and was only possible with Dutch permits. The import trade into Makassar became a monopoly in Dutch hands to the complete exclusion of all Europeans, Arabs from Java, Malays, Achinese, and Siamese. A Dutch fortress was to be established at Jupandan and Dutch money was made current in Makassar. This treaty was made the basis of the Dutch relationship with all the Makassarese vassals in Celebes and elsewhere, and it marks the complete success of the Dutch attempts to establish a monopoly of the spice trade. The history of subsequent relations between the Company and their possessions in the Moluccas can be briefly described. When they found the assistance of the Sultan of Ternate superfluous, the Dutch began to strip him of his possessions, which they took under their own direct government. In 1683 all contracts with Ternate were declared void, and the chiefs received their lands as fiefs to be held directly from the Dutch. The same policy was pursued with the vassals of Tidore and Makassar, whose homage hitherto rendered to the suzerain Sultans was now transferred to the Company.

Political Relations of the Company in Java

A condition which had always been essential to the successful exploitation of the Moluccas was the possession of a base adjacent to the entrances to the archipelago, and supply dépôts in convenient situations on the route to the Spice

Islands. The considerations which impelled both English and Dutch to set up their head-quarters at Bantam have already been narrated, and both nations, like the Portuguese before them, had established supply dépôts at ports in East Java. The political relations with the native states of Bantam and Mataram which ensued as a consequence of these settlements, are specially important as the beginning of the Dutch relationship with native Java.

Bantam, when the Dutch first arrived in 1596, was ruled by a governor, Mangku Bumi by name, and on the death of Mohammed (grandson of Hasan ed-Din), then absent on a campaign against Palembang, this governor became regent on behalf of the infant heir. The success of the first Dutch visit was marred by the intrigues of the Portuguese, but on their return friendly relations with the governor were restored. In 1603 a lodge was built and the port became the rallying point for Dutch ships. In 1608 Mangku Bumi was murdered, and for a time civil war ensued between the party of the new regent, Manggala, and the Bantamese nobility. Among the latter was the chief of Jacatra, and with him Verhoeff, in order to anticipate any unfriendly treatment from the new regent, entered into negotiations with regard to a settlement at Jacatra. When, as had been expected, Manggala began an oppressive policy towards the Europeans, an agreement was made in 1611 with the Bantamese vassal of Jacatra by which the Dutch were permitted to settle in this hitherto insignificant port. They did not abandon their post in Bantam, and for many years they were in doubt as to which of the two places should be made the head-quarters.

The new settlement further enraged Manggala, who increased his exactions and was guilty of various outrages on Dutch sailors. There was a division of opinion on the subject of the complete abandonment of Bantam. Governor-General Ræal favoured a conciliatory policy towards the Bantamese authorities, while his subordinate, Koen, urged removal to Jacatra and hostilities against both the English and Bantamese. Matters were brought to a head by the joint attack on the Dutch settlement at Jacatra by the local chief and the English, which, as has been seen, failed owing to the intervention of the Bantamese regent. The chief of Jacatra was driven from his capital, which, under the name of Batavia, became the sole

property of the Dutch and the head-quarters of their East Indian commerce. Chinese colonists came from Bantam, and in 1620 a bailiff and five sheriffs were administering Dutch laws.

It is now necessary to turn to the settlements of the company to the westwards where it came in contact with the state of Mataram. Their first settlement on this region was at Grisee, established in 1602. Here in 1612 they fell foul of their competitors the Javanese traders who acted as intermediaries for the Portuguese in obtaining spices from Banda. Complaint was made to the Adipati of Surabaya. The latter governed all north-east Java as a vassal of Mataram, but at this time he was engaged in one of his many revolts against his overlord. In the fighting which ensued Grisee was destroyed (1613), and with it the Dutch factory.

At the invitation of the Japara chiefs the Dutch made a new *dépôt* at their capital. Here both set up a factory to accumulate rice stocks for the supply of ships bound for the Moluccas. On the death of Sultan Krapiyak in 1614, the regent Ageng granted permission for the building of forts at Japara and Jaratan. It seemed that Ageng wished to treat them favourably, and he made promises of building materials and rice. Owing to pre-occupation with the wars against the rebellious Adipati of Surabaya, Ageng did not fulfil his promises, and even refused to see Dutch deputations.

In 1618 the lodge at Japara was attacked, most of the garrison was massacred, and the leaders were sent as prisoners to Mataram. Koen retaliated by sending two expeditions to destroy Japara, and as this had no effect the Dutch allied themselves with the Adipati of Surabaya and assisted in the defence of Grisee. This action brought Sultan Ageng to terms, and his prisoners were released. He even went so far as to propose an alliance against Bantam, but as the Dutch were now secure in Batavia they had no wish to destroy an effective counterpoise to the great power of Mataram. In order to force the Dutch from their policy of neutrality Ageng withheld rice supplies and caused a serious shortage in Batavia. As the price of a renewal of the supply Ageng demanded Dutch recognition of his supremacy, but this was refused. This attitude, coupled with their policy in relation to Bantam, finally caused a rupture. The Bantamese, fearing either

a hostile combination of Mataram and the Company or the seizure of Batavia by Ageng, made an attempt on the latter place themselves, but were unsuccessful.

Meanwhile the army of Mataram in 1629 moved in force against Batavia and fighting raged in the neighbourhood of the town from August to February of the next year. By this time Ageng's army was so wasted by disease and privation that it was withdrawn and diverted against Cheribon. These extensive operations alarmed the Prince of Bantam (the governor had resigned in 1624), who expected soon to feel the whole brunt of the Susuhunan's attack, and he made an alliance with the Dutch. In August 1630 Ageng returned to the attack, but again the ravages of disease compelled his retirement, after suffering heavy losses. These two victories enhanced the prestige of the Company, and many of the inhabitants of the Batavian hinterland placed themselves under Dutch protection. Already, in 1620, the Company had declared itself to be the proprietor of the slice of territory stretching from sea to sea and enclosed by Cheribon in the east and Bantam in the west.

A peace policy towards Mataram was now inaugurated, but Ageng's retention of Dutch prisoners impelled Governor-General Brouwer to incite the princes of Bali to make war on Mataram. In this he was unsuccessful, and he was finally compelled to recognize Ageng as Supreme Lord of all Java. On Brouwer's recall friendly relations were established in 1636 with Bantam on the basis of the Dutch retention of the spice monopoly. When in 1638, as a result of the assumption on the part of the Bantamese prince of the title of Sultan, Ageng again attempted to inveigle the Dutch into a hostile combination against that state, he was again met with a refusal.

So far, the Company's objective had been the monopoly of the spice trade, and to this end it had been compelled to engage in wars in the Moluccas, in Celebes, and in Java. The authorities at Batavia hoped that once their monopoly in spices was made secure and their head-quarters and supply dépôts in Java were immune from attack, their political commitments would cease. But the prospect of economic aggrandizement in other directions drew them on into activities which eventually involved their assumption of political sovereignty over the whole of Java. A hint as to the nature of this new

economic development has already been given. One of the first commodities shipped to Europe in the Company's vessels had been the pepper produced in Bantam and in the Lampong districts of Sumatra. This trade was shared by other European nationalities, such as English, Portuguese, French, and Danes, not to speak of a host of Oriental native merchants, and it can be seen that in their desire to exclude this competition the Dutch would be inevitably drawn into a policy of intervention in the politics of Bantam. In the same way the Company were dependent upon the goodwill of the Government of Mataram for the supplies of rice needed to victual the garrisons of the Moluccas, besides Batavia itself. These supplies were granted and withheld in so capricious a fashion, and through devastating wars were so much interfered with, that in order to avoid the danger of famine the Dutch were compelled to obtain sooner or later some sort of control over the Government of Mataram. In both these cases the Batavian authorities were impressed by the possibilities of a more extensive cultivation for export, a policy which later they extended to crops like coffee, indigo, and others introduced from abroad towards the end of the seventeenth century. Culture on this scale involved control over the native population and also over the native political organizations, which in past years had been devoted to the exaction of produce from the cultivators for the benefit of the native rulers. So the Company, although earnestly desiring peaceful relations with the natives, were by their commercial rapacity drawn into diplomatic intrigues, extensive campaigns, and territorial aggrandizement.

The political arena into which they entered has already been described. Briefly, there were three independent states in Java when the Dutch first settled there. Bantam in the west, while not exercising sway over a large area, was yet powerful enough not only to maintain its independence but to set up as rival to its greater neighbour, Mataram, with which it was always at enmity. The empire of Mataram under Sultan Ageng embraced all Java except Bantam in the west and the sparsely populated country of Balambangan in the east, which rendered an intermittent homage to the princes of Bali. It was characteristic of Bantam and in a greater degree of Mataram that their power had been acquired and continued to be maintained by a succession of wars either between the

overlord and his vassals or between different members of the reigning house. In the case of Mataram it has already been observed that the sovereign's control over the provinces ruled by the Adipati of Surabaya was always of the slightest kind, and had to be constantly re-established by force of arms. The same is true of the chiefs in Madura, who play a prominent part in subsequent history. Such, briefly, is the political situation into which the Dutch trading company entered, possessed of military resources which, in 1620, consisted of 1,500 men, of whom 400 only were in Java. In the course of fifty years the army in Java increased to 1,000, while the total force in the East Indies amounted in the eighteenth century to 10,000 men. The force was always small compared with the enormous numbers of the native armies, but the reason of its success is to be found in the opportunities afforded to diplomacy. The constant dissensions among the native princes enabled the Dutch to ally themselves with one side or the other. Alone they were strong enough to act on the defensive, but allied with a native faction they were able to wage offensive operations on a large scale.

For forty years after Sultan Ageng's unsuccessful attempt on Batavia the Dutch were at peace with Mataram. On the Sultan's death in 1645 the Company became the ally and mainstay of his successors, from whom they extracted valuable commercial privileges, and extended their territories. As a reward for assistance lent to Susuhunans, as the rulers of Mataram were now entitled, against their rebellious subjects and the ambitious prince of Madura, the Dutch gained control of the harbours along the north coast of Java and pushed their eastern frontier to the River Pamunukan (1678). A few years later a pro-English Sultan of Bantam was deposed and Europeans expelled from his kingdom. Commercial privileges, including the right to all the pepper produce, were obtained by the Company from the new Sultan, who became a Dutch dependent (1685). In Madura also the Dutch became paramount, though they were less successful in Balambangan in East Java, a vassal state of Bali.

Although the Company had made its influence felt throughout the whole length of Java, it was far from being able to exercise any close control even over a large part of the territory nominally subject to its political authority. It was not at this time,

beyond the enforcing of its commercial privileges, either anxious or able to undertake the work of government, and in consequence that task was still left in the hands of native regents. Its control over the independent states of Bantam and Mataram was limited to a garrison at the courts of the respective rulers, who, when the need of protection against their own subjects had disappeared, were ready enough to repudiate their obligations to the Company. Apart from the attitude of the ruler of Mataram, an important consideration was the temper of his many and powerful vassals who did not in the least consider themselves bound by his policy. For instance, the Madurese chiefs, the Adipati of Surabaya, and the chiefs in Kediri and Malang, besides the Balinese regents of Balambangan, who at all times had given trouble to Mataram, were not likely to be more indulgent towards a Susuhunan who owed his throne to foreign interlopers.

The Susuhunan Amangu Rat II himself was the first to give trouble. He evaded carrying out the terms of his contracts, and gave shelter and honours to Surapati, an enemy of the Dutch, and much against their will the Company was compelled to divert the succession to a representative of another branch of the family, which in 1704 was proclaimed Susuhunan Paku Buvana. Cheribon and Preanger were added to the Company's territory, and these regions were organized with a view to the production of crops of cotton, indigo, and pepper. The position of the new Susuhunan during the following half-century had to be maintained by Dutch arms against the Adipatis of Surabaya, the followers of Surapati, and rebellious nobles in Mataram. The Susuhunan himself on occasion, as during the remarkable rebellion of the Chinese (1740), secretly supported the enemies of his hated patrons.

War of Java, 1745-58

For over a century the Dutch pursued the policy of bolstering up the reigning dynasty of Mataram with a view to establishing one authority with which they could deal and upon which they could rely for the fulfilment of contracts. The proud nobles of Mataram resented the presence in Java of an alien race to which they reckoned themselves equal in courage if not in guile. They viewed with chagrin the pusillanimity of the reigning house, which by the latest treaty in its amplified

form had granted away almost all the northern coast districts from one end of Java to the other. (Tegal and Pekalongan, the only coastal districts remaining to the Susuhunan, had been, in 1746, granted to the Company for an annual payment.) Moreover, the centralization of the Susuhunan's power had also had the effect of crystallizing the different elements of local opposition, and the unexpected result of the Dutch policy was to forge a political instrument destined to be used against themselves. That this opposition was already formidable had been made abundantly clear by the widespread sympathy of the Javanese with the Chinese revolt in 1740.

Several of the principal Javanese opponents of the Dutch established themselves in the province of Sukawati. Here they were subsequently joined by malcontents from the court of Surakarta, Mangku Bumi, the Susuhunan's younger brother, and Mas Sayed, both energetic and experienced warriors. The creation of a formidable political power so near to the capital of Mataram was a menace to the integrity of the empire, and the Dutch were strongly opposed to it. Shortly afterwards, in 1745, began the War of Java. In 1747 Mangku Bumi tried to come to terms with the Dutch, but as his main condition was that he should be proclaimed Pangeran Adipati or Crown Prince of Mataram his offer was refused. In 1748 the Susuhunan abdicated in favour of the Company, to whom he bequeathed the right of the disposal of his dominions. The Pangeran Adipati was now proclaimed as Susuhunan Paku Buvana III, while Mangku Bumi, who had hitherto only pretended to the rank of Sultan of Mataram, had himself invested with great pomp as Susuhunan Paku Buvana Senapati Mataram. At this time Mangku Bumi was in possession of all Mataram, and he and Mas Sayed were even ravaging the immediate environs of Surakarta. With the help of the Madurese the Company's troops drove them into the southern mountains, but in 1751 the rebels again took the field and met with some success. The pretensions of Mas Sayed so irritated his father-in-law that a serious dissension arose, and Mangku Bumi negotiated a separate peace with the Dutch. The latter, who realized that they could never achieve any permanent success against the guerilla warfare waged by the rebels in a country full of sympathizers, had to accept the inevitable and come to terms. They agreed to recognize Mangku Bumi's sovereignty

as Sultan of Mataram, but as they had been bequeathed the disposal of the late Susuhunan's dominions they induced the new ruler to accept his share as an hereditary fief held directly from the Company. His territory was in extent slightly greater than that left to the Susuhunan, whose lands were so disposed as to enclose it on nearly every side.

It remained to subdue the recalcitrant Mas Sayed, who continued to defend himself with great skill, but in 1758 he was induced to render homage to the Susuhunan in return for a considerable grant of land to be held as a fief.

By some writers this settlement is described as a triumph of Dutch policy, but it seems clear that their course of action was forced upon them. In the first place they had no special desire to assume political sovereignty in Java while their commercial needs were supplied by a subservient native dynasty whose authority it was always their policy to maintain. This policy was defeated by the rebellious nobles of Mataram, and the supreme authority of a docile Susuhunan was brought to an end; and after expending much blood and treasure in the effort to preserve it, the Company was compelled to recognize a new and powerful régime against which they had no safeguard but a nominal suzerainty. There is little doubt that the War of Java, which began in 1745 and dragged on to 1757, through the destruction and neglect of agriculture and the expenditure on warlike operations, was a very unprofitable venture for the Company, and contributed as much as anything to their eventual bankruptcy.

The second half of the eighteenth century was a time of comparative peace in Java. At the beginning of this period there was some trouble in Bantam, where the Dutch endeavoured to maintain their nominee in the face of popular hostility, but were compelled to compromise, though not without first extending their territory eastward and gaining a more secure hold on the pepper monopoly. In the extreme east also Dutch troops had to move against the Balinese regents in Balambangan, who, it was said, were the allies of the English. In order to prevent the latter from gaining control of the Bali Strait the Dutch head-quarters were established at Banyuwangi (1774). In the principalities of Central Java Dutch power was maintained largely through the agency of Mangku Bumi, since 1755 Sultan Amangku Buvana of Jokyakarta, who

helped especially to check the ambitious Mas.Sayed, now known as Amangku Nagara. This latter prince, besides the Susuhunan and the rulers of Bantam, Cheribon, and Madura, later came under the influence of the Wahabi movement, and it was only with the assistance of the Jokya prince that mischief was prevented. In Cheribon the princes were (1778) reduced to two, and these acted as servants of the Company in furthering the cultures which in this region were particularly profitable.

The Company's Administration

The territories subject to the direct rule of the Company were divided into two spheres of government. There was the old territory, consisting of Batavia, the Jacatra highlands, Krawang, and part of Preanger. Secondly there were the territories comprised in the government of the North-east Coast and East Point. From 1748 the North-east Coast was subject to a Governor whose head-quarters were at Semarang. He was conveniently situated to deal with the native princes of Surakarta and Jokyakarta, the Residents of which places acted under his commands. In native eyes the Governor of the North-east Coast became of greater importance than the Governor-General himself. His rank was made to equal that of the Sultan and Susuhunan, and his income, obtained in part from private trade, was enormous. Semarang, Demak, Kendal, and Kaliwangu were under his personal control. Between Cheribon and Kendal were the coast residencies of Tegal and Pekalongan, divided from each other by an estate leased out to the Chinese captain of Semarang. To the east of Demak were Japara, Javana, Rembang, while the Company's territory further to the east was called East Point. This division consisted of the regencies of Sidayu, Lamongan, Grisee, Surabaya, Porong, Banggil, Pasuruan, Malang, Ngantang, Banger, and West and East Balambangan. These were under a Director who in turn was subject to the Governor of the North-east Coast. Pasuruan and Banyuwangi were of necessity under the officers commanding the garrisons of those districts. Madura, which belonged to Surabaya, was divided up into the regencies of Madura, Sumanep, and Pamekasan. The native regents were given the old titles of *adipati* and *tumungung* in order to impress the native population, and, although only Company officials, were succeeded by their sons.

In this way a trading Company had developed into a Government, but its motives were still those of a business concern. Instead of buying and selling in a market in which it tended to enjoy a monopoly in both respects, as in the early days, it now depended for its stock in trade upon what was a political revenue thinly disguised. This revenue was obtained in two ways: by 'contingents' and 'forced deliveries'. The first was a contribution levied on all the native regents and paid by them in recognition of Dutch political supremacy; the second was a purchase of goods at a low price which the native regents were compelled to supply.

It has been said by some critics that the ruin of the Company was due to its change of character from trader to governor. It is probably true that the Company did better as a trader than as a governor, but it is to be borne in mind that the same canker affected it in both capacities. It was compelled to put forth the most strenuous efforts to secure its trade monopoly against competitors, and this effort had to be maintained for the purpose of establishing a political supremacy. Meanwhile, the ease with which the monopoly once secured was administered sapped individual enterprise and even individual honesty, and led to wastefulness on a scale which, together with the expenditure on the maintenance of the monopoly, could not but end in bankruptcy. One beneficent result indirectly achieved was the gradual establishment of peace in Java. The severity of the discipline inflicted on the natives, both high and low, by the Company's commercial methods, while it was humiliating, yet had the effect of introducing habits of industry and social orderliness.

Failure of the Company

As early as 1693 the Company began to lose on its Indian trade, and the losses in this department not only swallowed contemporary profits in Europe, but also the total retrospective profits. In 1730 the trade in Europe began to show loss, and from that time forward the Company's dividends were paid out of borrowed money. The war with England in 1780 hastened its ruin, and in 1782 it issued its last dividend. In 1791 Commissioners left Holland for Netherlands India with the object of introducing drastic reforms. They effected changes for the better at the Cape of Good Hope and in conti-

mental India, while in Java they prepared estimates which they imagined would be fulfilled under reformed administration. Whatever success they might have expected was prevented by the outbreak of war with England in 1795, and although Java was not captured it was subjected to an intermittent blockade in 1800. What trade was possible under these conditions fell into the hands of neutrals. The Commissioners returned to Europe; in 1798 the Company was wound up, and the task of administering the Indian colonies fell into the hands of the Council of the Asiatic Possessions, which ruled them on behalf of the State.

THE COMMISSION OF 1803

The Peace of Amiens in 1802, which freed communications between Netherlands India and the mother country, since the departure of the House of Orange called the Batavian Republic, gave rise to much discussion as to the future government of the colonies. In 1803 a Commission issued a report. This Commission is noteworthy as having as one of its members Van Hogendorp, who advocated the exploitation of Java on the basis of a cultivation freed from all feudal obligations and subject only to regular taxation. This plan involved the abandonment of the whole native organization, both the feudal superstructure and the village institution underneath. It was therefore deemed by the majority of the Commissioners to be too revolutionary, and they declined to adopt it. In the plan ultimately agreed upon the native organization was retained for the purpose of providing the 'contingents' which in the future were to be confined to the commodities of pepper and coffee. By this means it was hoped that the European government would remain in close touch with the native rulers without interfering except to suppress obvious abuses of the administration. It was a system of oversight rather than of government.

The Commission were also of the opinion that a government would not succeed in a commercial venture where a trading company had already failed, so they divested the new political régime of some of its commercial functions, and private individuals, including those of friendly powers, were admitted to a trade in those articles not included in the government monopoly. As all the staples were in the latter category the measure of free trade was not very great. Indeed, it may be said that

the importance of the Commission's recommendations lay in the improvement of the administration rather than in any reform of policy.

No steps were taken to put these recommendations into effect until 1806, when a colonial charter on even more liberal lines than those recommended was drawn up, providing for almost complete freedom in trade and cultivation. However, it was in this year that Louis Bonaparte became King of Holland, and there ensued several changes in the colonial department of the Dutch Government. The Council of the Asiatic Possessions was dissolved and a colonial ministry was substituted. Marshal Daendels was appointed Governor-General, and he arrived at Batavia in January 1808.

DAENDELS' GOVERNOR-GENERALSHIP

Daendels had been from the first a friend of the French Revolution and an enemy of the House of Orange. He owed his new appointment to his military services and partisanship for Bonaparte, and although armed with the recommendations of the Commission of 1803 his main purpose was military—that of defending Java against a possible English attack. Such ideas of statecraft as he possessed were those of France, and he employed them to simplify the administrative chaos that he found in Java. Whatever merits his ideas may have possessed were destined to be obscured in the discontent aroused by the manner of their institution. Daendels conceived himself, probably rightly, as acting in a time of emergency, and his conduct is marked by the autocratic spirit of the soldier rather than the tact of a statesman.

It was in connexion with one of his military objects that Daendels was led into his first political blunder. The Dutch fleet in the East had been destroyed piecemeal by the English. Daendels, however, seemed to expect a fleet from Europe, although this event, after the Nile and Trafalgar, was highly improbable. For the purpose of accommodating this expected fleet he undertook the erection of extensive fortifications in Merah Bay in Bantam, and impressed into his service a thousand Bantamese labourers. The general unhealthiness of the conditions resulted in an appalling number of deaths, and the Sultan of Bantam petitioned to be excused from supplying further labourers. Daendels's reply took the form

of three demands, viz. : the immediate supply of 1,000 natives ; the removal of the Bantamese Prime Minister, accused by Daendels of being responsible for the stopping of the supply ; and the removal of the Bantamese capital to Anjer. These three demands caused much irritation in Bantam, and the party of the Prime Minister seized the capital and murdered the Dutch Resident. Without hesitation Daendels marched against Bantam in force, deposed the Sultan, and executed the Prime Minister. Bantam was declared to be a Crown territory, and at this time, in 1809, part of it was added to Batavia. The Lampongs also fell under direct Dutch government, and the rest of Bantam was given to the ex-Sultan's heir, who, though in reality only an ordinary regent, still kept the style of Sultan Abu II. His administration was supervised by a European official and his revenue all went to the Batavian Government, while he himself, as a government official, received a salary.

This arrangement did not ensure a permanent settlement. In 1810 a large body of rebel Bantamese established themselves in the extreme west of the territory and defied all Daendels's attempts to reduce them to submission. With his usual impetuosity Daendels now deposed the new Sultan and in his place established another prince, whose jurisdiction was confined to the uplands of Bantam. The lowlands of the north and west were made into the regencies of Bantam and Anjer. The new Sultan had his capital at Pandeglang, and enjoyed all his revenues except that from opium. Meanwhile a royal prince, Achmet by name, still maintained himself at the head of a large body of rebels. Daendels in desperation went so far as to try and propitiate this prince by an offer of territory, but as he was generally supposed to have been in league with the English authorities at Benkulen, and probably expected a more substantial reward, he refused the offer. Daendels found it was easier to conquer Bantam than to govern it, and it remained in an unsettled state throughout the period of his rule.

In Cheribon, also, Daendels effected various political changes. These readjustments did not at once result in tranquillity, and the last rebel chief maintained himself in defiance of the Government until a few months after the arrival of the British, when he was captured by their forces. In 1817 there was some trouble with the senior Sultan, who tried to reassert his former dignity, and was in consequence deposed, his territory being

divided between the other two. Other territorial adjustments were also made at this time, and the political divisions of West Java became very much as they are to-day.

In the time of the Company all negotiations with the native princes of Central Java had been in the hands of the Dutch Governor at Semarang. Daendels, with his French notions of a centralized government, did away to some extent with the power of this functionary. The Residents at Surakarta and Jokyakarta were made responsible directly to himself, and in 1808 he went in person to Semarang to receive the homage of the Sultan and the Susuhunan. He rather foolishly explained to the princes that, as feudalism had been universally abolished, their homage represented only the deference due from the weak to the strong, an explanation not calculated to appeal to minds enslaved by ancient forms and incapable of apprehending abstract ideas. He also made some unnecessary changes in ceremonial at the native Courts, which had hitherto been devised to flatter the vanity of native rulers while at the same time depriving them of all real power. Daendels's changes merely served to remind them of this fact.

The state of affairs in the principalities was not all good. Nothing better illustrates the unsatisfactory nature of the settlement of 1755, by which the Dutch were forced to recognize two native sovereignties where there had previously been only one. The more important was of course that of Jokyakarta, whose first ruler had established himself by the sword and was surrounded by a nobility whose titles were held by a similar warrant. While he had maintained friendly relations with the Dutch, chiefly because he was left very much to himself, his successor, Amangku Buvana II, encouraged no doubt by the external embarrassments of the Batavian Government, assumed towards the European overlords an attitude of aggressive independence if not of hostility. His subjects appear to have been guilty of robberies committed in Dutch Residencies and also of inducing Dutch soldiers to desert. Towards the end of 1810 Daendels dispatched an ultimatum to the Sultan, and backed it up by a military demonstration at Semarang. This had the desired effect of inducing the Sultan to yield to the demands made by Daendels, which included restitution for damage done by his subjects in Dutch Residencies. Daendels now apparently thought he had an opportunity of thoroughly

reducing both native princes to submission. So he followed up his demands by compelling the old Sultan to abdicate in favour of the heir who was his legitimate successor, and the State of Jokyakarta was charged with the expenses of the Dutch expedition.

In 1811 Daendels moved to Surakarta, where he concluded with the Susuhunan an agreement by which the latter gave up the coast dues to which he was entitled by the contracts of 1743 and 1746. Certain Surakarta enclaves in Dutch territory were given up in exchange for the eastern districts of Malang and Ngantang. The Susuhunan agreed to maintain various public works in return for the payment of his debts by the Dutch. This agreement was followed by another concluded with the new Prince Regent of Jokyakarta, who also agreed to give up his coast dues. His debt to the Dutch was remitted and the parts of the North-East Coast Regencies belonging to him were exchanged for certain Dutch lands on the western boundary of his dominions. In not banishing the old Sultan after compelling him to abdicate Daendels made a serious mistake. The latter remained in his palace at Jokyakarta, where he was the real ruler of the State and a constant source of disaffection.

ADMINISTRATIVE REFORMS OF DAENDELS

In the eighteenth century the power of the Governor-General had diminished, and when Daendels arrived in Java his weight in the Council of India was only equal to that of an ordinary councillor. Hence he was often compelled to carry out a policy with which he disagreed. Daendels was not long in altering this arrangement. The Governor-General was empowered to direct the forces by sea and land, to override the opinion of the majority of the councillors, and at all times to rely upon his own judgement. He was provided with a deputy in the person of a Lieutenant Governor-General, who presided on his behalf in the Council and submitted to it only those proposals which the Governor-General deemed necessary. In the sphere of local government the old intermediate institutions, such as the Government of the North-East Coast and the territories under its jurisdiction, were split up into Prefectures, whose Prefects were directly responsible to the Government at Batavia. Although bearing the same titles these Prefects had functions which varied according to the locality, and they were paid

accordingly. The Prefects at the native Courts were more diplomats than administrators. The one survival of the old separate institution was the official who was a sort of Inspector-General, whose duty it was to supervise the work of the Prefects on its purely mercantile side. One change in the right direction was the payment of official salaries to the Prefects and an abolition of their former sources of profit derived from 'overweight' and 'short payment'. This principle was extended to the native regents, who now became 'king's servants' and received a salary. Instead of the former basis of contract the regents, as royal officials, received instructions. While they were subordinate to the Prefect they had the right of laying complaints before the Governor-General. The old method of raising revenue by means of 'contingents' and 'forced deliveries' was retained, but now it was hoped that all the product would find its way into the royal treasury.

These reforms have been criticized adversely by a Dutch writer, Van de Venter, who charges Daendels with merely shifting the working of a bad system from the Company to the State. This surely was an improvement. The system of obtaining revenue by means of 'forced deliveries' and 'contingents' was undoubtedly oppressive, but hitherto the abuse had been lost to view in the ramifications of illicit private gain. Now that the State had gained control of the system the dimensions of the evil could be ascertained and the situation could be more readily manipulated. De Venter states, also, that no improvement was effected by issuing instructions to the regents instead of concluding a contract. But this new relationship gave the Government a legal right to demand from the regent a satisfactory performance of his office, and in case of necessity the right to dismiss him. This step afterwards obtained the approval of Raffles, who nevertheless condemned the arrangement by which the regents were left the power of levying taxes. As they were subjected by the Government to increased demands of all kinds this power provided a loophole for oppression and private gain.

For certain localities there were special forms of administration, such as the districts of Rembang, Lasem, and Tuban, formerly forming one Residency, but now made subject to the Government of a member of the college for administering woods and forests. Native chiefs were prohibited from letting out

villages to Chinamen, who were in the habit of extorting the maximum profit from their holdings, without regard for the welfare of the soil or its cultivators.

One very large administrative organization instituted by Daendels was that which controlled the cultivation of coffee. This culture was extended by Daendels to the whole of Java. The old service required of the natives on public works, such as roads, ditches, and dikes, was retained, while extraordinary services, as those required on military works, were remunerated. The pawning of services to a creditor was prohibited.

To Daendels's credit also was his reorganization of justice, which is described as being in a shocking condition, and there can be no doubt that he stirred up the administration and created an atmosphere of readiness for radical reforms. Some of his own measures were themselves not merely provocative, but steps in the right direction, and that Raffles was able to make an immediate start on his policy of reform was in great measure due to the preliminary essays of his predecessor.

However, several of his measures and the methods which he employed to carry them into effect are open to adverse criticism. While it is not fair, in view of the embarrassment of trade due to a state of war, to accuse him of not making his administration pay its way, he may be charged with embarking in enterprises involving unnecessary expenditure. In the state of trade as it was then, Daendels was probably ill-advised to extend the coffee culture and incur the expense of maintaining an elaborate administration. It was still greater folly to frighten away the American buyers upon whom Java was dependent for a market for the enormous coffee produce. His restrictions aimed against smuggling had the effect of almost annihilating the coasting trade. The lavish expenditure devoted by Daendels to the erection of various public works was hardly justifiable in a time of stress, and the inevitable deficit in the public exchequer led to the adoption of questionable financial expedients, besides heavy taxation. Trust funds were commandeered, and there was an extensive issue of paper money. This was introduced into currency by means of selling the public lands round Batavia and also in Probolinggo. An indication of the wealth of the Chinese can be got from the fact that the Chinese 'captain' at Surabaya made a purchase to the value of 1,000,000 dollars, payable in twenty half-yearly instalments. This particular

issue of paper (the Probolinggo) was afterwards rated by Raffles at half its face value.* The Government, according to Daendels's successor, Janssens, were eventually forced to use coin for certain payments to the natives, who were so unable to make use of the paper that coin was essential to their continuing to produce. Janssens further remarks that Daendels had exhausted all the resources of the country.

However, the main criticism of Daendels is directed against his political policy. It manifested a criminal lack of political sagacity that the moral asset of the country, the loyalty of the Javanese, should have been wantonly dissipated. The native princes were encouraged to look for help to the enemy who was threatening the Franco-Dutch rule. Even the European officials, whose loyalty to the Bonapartist régime in Holland might have been questioned from the first, were confirmed in their distrust by the high-handed procedure of Daendels. It was a country with exhausted material resources and deficient in political enthusiasm which Janssens, on the recall of Daendels in May 1811, was called upon to defend against the attack of a much more powerful enemy.

BRITISH CONQUEST OF JAVA, 1811

The Dutch army had been withdrawn from most of the posts in the outer islands, and in 1811 there was a force of only 400 men distributed among the posts of Palembang, Timor, and Makassar. The forts in the Moluccas, in the northern division of Celebes, and in the Amboina and Banda Islands had during Daendels's rule all fallen into English hands. Janssens is stated by one authority to have had under his command a force of 17,000 men, but this is probably an over-estimate. The English force which, in August 1811, effected a landing without opposition at Chingchilling, about 12 miles from Batavia, numbered about 9,000 effective troops. After occupying Batavia they had their first serious skirmish with a Dutch force, which was dislodged from entrenchments at Weltevreden. Very shortly afterwards the main Dutch position at Meester Cornelis, which had been prepared by Daendels and heavily fortified, was taken by assault, and Janssens with a few survivors was driven eastwards, whither he was followed by a British force. In the centre of Java the troops of the native princes mustered for his support, but their assistance was only

half-hearted. The final capitulation of the island was signed on September 18, 1811 at Semarang, by Janssens and the British commander, Sir Samuel Auchmuty.

BRITISH OCCUPATION : THOMAS STAMFORD RAFFLES

The intention of the British home authorities when they first contemplated the conquest of Java was to effect only a temporary occupation of the island. Since 1795 it had been practically French territory, and the British Government had been commissioned by the exiled William V of Orange to occupy the Dutch colonies on his behalf. The actual expedition was a joint undertaking of the English East India Company and the British Government, and its original object was merely to stamp out French power in Java by destroying all the fortifications and turning the island over to the natives. The consequences of such a proceeding would have been calamitous, as the Governor-General of Bengal, Lord Minto, pointed out. Besides this laudable regard for European prestige in the East there were undoubtedly other reasons which induced Lord Minto to modify the plan contained in the original instructions. He had been much impressed by the arguments of his brilliant subordinate, Thomas Stamford Raffles, Agent to the Bengal Government at Malacca. This official had collected a great deal of information about political and economic conditions in Java, and he set forth the mutual benefits which would accrue to the natives and to the English East India Company from Java under British rule. Therefore, though the fate of Java must in the end have always depended on the military situation in Europe, both Lord Minto and Raffles, the latter especially, were not without hope that it would be retained as a British possession, and their scheme containing the outlines of a government for the island was intended as much to attach the natives to British rule as to preserve order and establish general good government.

Lord Minto appointed Raffles to be Lieutenant-Governor of Java under the Government of Bengal, and he was to be assisted by a Council on which were two prominent Dutch gentlemen, Cransen and Muntinge. The Lieutenant-Governor, however, retained much of the power which had been exercised by Daendels, though in a very different spirit. Of Raffles it may briefly be said that since the age of fourteen he had been in the

employ of the English East India Company, and though without influence he had by his general capacity attained at the age of thirty the high position of Agent of the Bengal Government with the Malay States. His general ability, coupled with an unusual knowledge of the language and customs of the Malay race, had recommended him to the notice of Lord Minto, and on the expedition to Java Raffles accompanied the Governor-General as his secretary. On the conquest of the island he was at once entrusted with the task of carrying out the policy briefly outlined in Lord Minto's proclamation. This proclamation was couched in very general terms, and was directed at assuring the natives and the Dutch of equitable treatment at the hands of the new rulers. For this purpose it sketched in a general way the principles of the justice to be administered. The subject of policy towards the independent native princes was not treated as this could only be evolved from experience.

NATIVE PRINCES UNDER THE BRITISH OCCUPATION

There was, as might be expected, a general disposition on the part of these potentates to turn the situation arising out of the destruction of Dutch rule to their own advantage. The Sultan of Jokyakarta, now restored to his former power and much the more formidable of the two princes of Central Java, formulated three demands: (1) that the dues of the North-East Coast ceded to the Dutch by the contracts of 1743 and 1746 should be restored (this deprivation had always rankled in the minds of the native princes); (2) that the burial-places of his ancestors should be given up; and (3) that members of the royal house banished by Daendels should be brought back. As the restoration of the burial-places involved a large part of the North-East Coast territories the combined demands represented nothing short of the restoration of the *status quo* of the early part of the eighteenth century. Raffles apparently gave these requests his serious consideration. He was eager enough to grant the last, and the return of Nata Kasuma was the means of creating a pro-British party at the Court of Jokyakarta. The other two requests, however, could not be met, although Raffles seems to have considered the idea of paying an indemnity. It could not be hoped that the Sultan, who during the years of the Company's decline had been aspiring to a greater independence, would quietly acquiesce in the substitution of another

European sovereignty after he had been relieved of the first. In spite of the protests of the Dutch Resident, still in office, he proceeded to assume the style of an independent monarch, to renew the ceremonial abolished by Daendels, and finally to cause the execution of the pro-European Danu Raja. In December 1811 Raffles himself arrived at Semarang, and thence journeyed first to Surakarta, where, as a result of negotiations with the Susuhunan, a treaty was drawn up in which the latter agreed to abandon his claim to the coast dues, and agreed to accept in return for the proceeds of the toll-gates and birds'-nest cliffs an annual payment of 120,000 dollars. Further, his jurisdiction was strictly limited to Javanese belonging to his own dominions, and he recognized British suzerainty. A similar agreement regarding revenue was made with the Sultan of Jokyakarta, whom Raffles now recognized in preference to the Prince Regent. But here Raffles interfered much more with the native government. It was arranged that for all practical purposes the British Resident should act as prime minister, while Nata Kasuma was established in a fief of the Sultan's dominions.

Very soon after his return from the native courts Raffles's attention was drawn to Palembang, where the Sultan, after a tardy recognition of British suzerainty, had massacred many of the Dutch settlers. In the middle of April 1812 a British force under Colonel Gillespie landed and drove the Sultan from his capital. His brother was installed in his place, and it was at this time that the islands of Banka and Billiton were ceded to Great Britain. The absence of the main British force on the Palembang expedition encouraged the Sultan of Jokyakarta to exhibit an attitude openly hostile to the new Government. He began a campaign against the party of the ex-Prince Regent, increased his army, refused to give up the toll-gate revenues, and entered into a conspiracy with the Susuhunan which had for its object the destruction of European power in Java.

In June 1812 Raffles, without waiting for the return of the main force from Palembang, set out with a force of 1,200 men. His plans were probably helped by the distractions caused at the Jokya Court by the parties of Nata Kasuma and the ex-Prince Regent. Nevertheless, the Sultan's *kraton* was held by about 11,000 men, and bands of Javanese harassed the communications of the British force. After a preliminary bombard-

ment the *kraton* was taken by assault, and the nationalist movement was effectually crushed. The Sultan was banished to Penang, and the Prince Regent assumed the title of Sultan Amangku Buvana III. All the Jokyakarta forces were disbanded, and a British bodyguard installed in their place. Both the Sultan and the Susuhunan had to make large concessions of territory to the extent, with little modification, previously arranged by Daendels but never carried out. Toll-gates, birds'-nest cliffs, and teak woods were given over to British control, as was the monopoly of opium. The princes' jurisdiction was again defined, and only permitted with the proviso that penalties involving torture, mutilation, and combats with tigers should be abolished. Nata Kasuma was confirmed in the possession of his fief and was given the duty of providing cavalry for the British Government. Annual salaries were paid to both the principal monarchs.

In 1814 the Sultan of Jokyakarta died, leaving a son aged 13 for whom Nata Kasuma was made Regent. This choice occasioned the creation of an anti-European party headed by the disappointed Dipa Negara. The Susuhunan, who had escaped lightly, was later induced to countenance a plot to incite to mutiny the sepoy garrison at Surakarta. This was frustrated in time, and the brother of the Susuhunan was banished while his queen was admonished.

Raffles's relations with the minor native princes were less difficult. He found it necessary to depose the presumptuous Achmet and recall an old Sultan to rule at Pandeglang in the uplands of Bantam. His interest in the revenue of the country induced him in March 1813 to take over the government, allowing the Sultan to retain his title and receive a large annual salary. This event practically abolished the last semblance of Bantam's independence. The princes of Madura had followed a purely opportunist policy, and after the conquest of Java they sided with the British. The Sultan of Bangkalang, known also as the Sultan of Madura, whose ancestor had acquired his rank and privileges through his services to the Dutch, died in 1815 and his son was recognized as Sultan Chakra Adiningrat II. He was confirmed in his position by the Dutch on their restoration, and retained his title until his death in 1874, when his successor assumed the style of *Panambahan*. The other Madurese prince, the Panambahan of Sumenep, was on friendly

terms with Raffles, for whom he carried out researches into the native records of his locality. His eldest son, who succeeded him, performed such excellent services in the Boni expedition and in the war against Dipa Negara, that in 1825 he received the title of Sultan. Raffles used the opportunity of a rising in Eastern Probolinggo, which was put down, to buy back the alienated lands in the three districts of Besuki, Panarukan, and Probolinggo. Cheribon was constantly subject to the depredations of a rebel chief named Bagus Rangen, who was held in so great respect by the common people that it was only with difficulty that his arrest was finally effected, and tranquillity was restored.

The effect of Raffles's measures against the native princes was to abolish in a great measure their independence. Ever since the settlement after the war of Java the European authorities had acted only on the defensive and had refrained from serious interference in the native politics of Central Java. The aggressive policy of Jokyakarta, provoked to some extent by the high-handed measures of Daendels, had necessitated a more vigorous attitude, which now, for the time being at any rate, had resulted in the European power becoming paramount throughout all Java. The sanction of government was now a British force, and the functions of government, such as the collection of revenues and the administration of justice, had to a great degree fallen into British hands. The Residents at the native Courts exercised a veto on legislation, and controlled the succession to the throne. But it was premature for Raffles to assert that the apparent tranquillity thus established was certain to endure. Future events were to show that the native character, formed by centuries of despotic and capricious government and of social unrest, besides all kinds of superstitious religious influences, was an incalculable factor, and as yet not reconciled to life in an orderly society under a stable and equitable government. The mere control of a native dynasty did not solve the problem, as the Dutch were to find to their cost.

RAFFLES'S RÉGIME OUTSIDE JAVA

Outside Java Raffles acted frankly as the agent of the English East India Company. In a report he sent to Lord Minto while he was gathering the information necessary for the expedition to Java, he advocated the establishment of

British influence on the islands of Bali, Banka, Celebes, and Halmaheira, and in parts of Borneo. When once these posts had been established he hoped that they would survive any international settlement which might possibly involve the retrocession to the French, or even to the Dutch, of Java and the Spice Islands. It has already been related how Raffles's policy was achieved in the case of Banka. It cannot be said that he was as successful in other directions. The change of régime in 1811 had caused an outbreak on the part of the more warlike States in Celebes, and there were no signs of an early settlement. About the same time as the Rajah of Boni began hostilities, two Bali princes invaded Banyuwangi in Eastern Java. This incursion was easily repelled by English forces from Surabaya, but it was decided to dispatch a punitive expedition, with the twofold object of reducing the refractory princes of Bali and then proceeding to Celebes to deal with the Rajah of Boni. In May 1814 a British force under Nightingall landed in Bali, and without much fighting the rebels were induced to sue for pardon. The expedition now proceeded to Celebes, where it inflicted a defeat on the Rajah of Boni, who, however, escaped and carried on a guerrilla warfare against British power until the date of the island's restoration to the Dutch. The object of establishing a strong English influence in Celebes was to restore the position which existed in the seventeenth century before the power of the Sultan of Makassar was broken by the Dutch, when English traders were enabled from this point of vantage to retain some share of the spice trade. The charge brought against Raffles's policy towards the Moluccas to the effect that he enforced a strict monopoly can very well be believed.

Before the conquest of Java, Raffles had in his report to Lord Minto referred to the various outrages on British shipping committed by the pirates of Borneo with the connivance, if not the approval, of the Sultans of the West Coast. After an unsuccessful attempt in 1812 a further expedition in 1813 succeeded in inflicting a severe defeat on the pirate chief of Sambas. On the death of the regular Sultan of that State the ex-pirate was installed as his successor. Whether this occurred as a result of compulsion or benevolent policy is not clear.

In this connexion it is interesting to note that there was an independent attempt to establish a British settlement in Borneo, but this time on the eastern side, where an Englishman

named Hare formed a colony, which, however, did not flourish and had to be abandoned. To the very last the English took an intermittent interest in Borneo, especially in those regions to which Dutch claims were at all doubtful.

BRITISH REFORM OF ADMINISTRATION IN JAVA

To return to Java : it is important to notice the changes which Raffles introduced into those territories which were directly subject to European government. There was a redistribution of administrative divisions which involved an increase in the number of prefectures, now called residencies. A new Residency of Buitenzorg was made out of the southern environs of Batavia ; Krawang, which was made into a prefecture by Daendels, was added to the Batavian Regencies, from this time usually known as the Preanger Regencies. The Residency of Bantam was enlarged by the addition of what remained of the territory subject to the Sultan ; Kedu and Rembang were made into residencies, and the latter was made to include Tuban. Three new residencies were formed in East Java, Pasuruan, Probolinggo (including Besuki and Panarukan), and Banyuwangi. (In Daendels's time the first two had been sold to Chinamen and the third was under martial law.) The rest of Java's East Point, including Japan and Wirasaba, was added to the Residency of Surabaya, to which Bangkalang and Pamekasan in Madura also belonged. The representatives of the European Government at the two native Courts of Jokyakarta and Surakarta were styled Residents, but their functions were mainly diplomatic.

With the help of Dutch officials Raffles was able to supply with Residents the increased number of administrative divisions, but generally speaking the official personnel below the rank of Resident consisted of natives, the most important of which was the *bopati*, who was the administrative head of a 'division'. The burden of work falling on the European Residents would in normal times have been oppressive ; in the period of judicial and fiscal reform inaugurated by Raffles it became overwhelming. The comprehensive instructions issued by Raffles to his Residents gained the approval of the Dutch, who retained them. Throughout the régime of Raffles, however, the shortage of personnel and the insufficiency of funds for official salaries were

a great handicap to the work of ordinary administration, and an almost insurmountable difficulty in the way of reform.

Of the reforms of Raffles those attempted in two departments of justice and revenue stand out most prominently. The reorganization of the judicial administration is admitted to have been one of the greatest benefits which accrued to Java as a result of the British rule. Raffles began by abolishing the separate jurisdiction which had existed for the special accommodation of the officials of the Dutch East India Company. Three Courts were set up at Batavia, Semarang, and Surabaya, each with a Resident, and three members possessing a civil and criminal jurisdiction over Europeans only. In civil suits the Dutch colonial law was retained, while in criminal cases English law was adopted. To relieve these courts from the burden of trivial suits a Court of Requests for the recovery of small debts and a police jurisdiction, exercised by magistrates appointed by the Government, were established in each of the three towns. In the sphere of provincial justice the old *landraad*, or country court, became the Resident's Court, presided over by the Resident assisted by the *bopatis* and native law officers. As a court of first instance it possessed extensive powers in native criminal cases besides a jurisdiction in the more important civil suits. For the latter the custom of the country was closely followed, but in criminal cases it was tempered by humanitarian principles. The Resident acted as justice of the peace in offences involving Europeans. A Court of Circuit, which was presided over by judges from the European courts of the three big towns, made a tour through the residencies once in three months and sat upon cases remanded by the Resident's Court. With this last-named court the functions of the European officials ceased, although Raffles would have liked to extend their administration to the lower courts. As this was not possible, the work of dispensing justice was left to the native officials. The lower jurisdictions comprised the village, the division, and the district. The village headman settled petty disputes and enforced the regulations of the village police system. The 'divisional' court imposed small fines and settled small civil suits, although unable to order imprisonment. The most important of the native courts was that of the 'district', presided over by a *bopati*, who tried civil suits of a slightly more important kind than those falling within the jurisdiction of the

divisional court. He had no powers in criminal cases, and recourse from the divisional court was direct to the Resident's court.¹ It is not pretended that this system was in full working order before Raffles left Java, but it was set going, and it was along these lines that the future development of the judicial system was made.

Any deficiencies in the working of the judicial system could be attributed largely to the lack of European officials, and the necessity of dependence on the native feudal organization. Raffles felt this even more when he came to institute a new system for the assessment and collection of taxes. The system in vogue in the eighteenth century which, with the very laudable improvement effected by Daendels on its administrative side, had continued to exist up to the conquest of the island, was in its nature oppressive, and in its administration corrupt as well.

The local native governments and their public services were maintained by indiscriminate exactions in labour and produce imposed upon the peasant cultivators. The proprietors of the soil were, by virtue of feudal custom, enabled to make various levies. To all these demands were added the levies of the European Government—the political tribute known as ‘contingents’, and the ‘forced deliveries’, which were commercial transactions only in name. In his plan to remedy this state of affairs Raffles adopted as the basic principle of his revenue theory that the State is the sole proprietor of the soil. On the basis of this assumption he abolished, at any rate theoretically, all other claims to ownership and their attendant privileges. The land rent, which was to take the place of the feudal imports and the old levies of the European Government, was to consist of a fixed proportion of the produce.²

Raffles could not hope, even in theory, to do away with all feudal obligations at one stroke. He himself authorized the employment of forced labour in the teak forests, and ‘forced deliveries’ were made of Preanger coffee. But apart from these legalized exceptions the old order of things in many localities proved too strong for the new system. Even the preliminary task of assessment was not begun on a sufficiently comprehen-

¹ The Regent, however, possessed powers in connexion with the administrative side of the police system.

² This system of revenue had already been proposed by Dirk van Hogendorp, a member of the Commission of 1803.

sive scale, and where it was begun it was not carried through, owing to the dearth of European officials. Nevertheless, the total revenue returns showed a steady increase, and an improvement on the returns during Daendels's administration. But with the increase in receipts there was a corresponding increase in the total expenses of administration, and during the three years of the working of the land rent by Raffles there was a deficit, which diminished each year, but in the last year amounted to a million and a half of rupees. The experiment is chiefly remarkable as a pioneer attempt to substitute taxation for feudal levies and tribute, and considering the short space of time at Raffles's disposal and the various other handicaps to which he was subject the results represent a considerable achievement.

Another improvement in the fiscal system was the abolition of the practice of farming of import and export duties. Custom-houses were set up at Batavia, Semarang, and Surabaya, and placed under the control of the local Resident. The duties imposed at this time had for one of their objects the preferential treatment of British shipping, and it was at this time that British cloth goods got a footing in the Javanese market and maintained themselves there in spite of prohibitory tariffs. With the system of internal tolls Raffles did little in the way of reform. The toll-gates were largely in the hands of Chinese 'farmers', who managed on an average to extort about 50 per cent. of the produce on its way to market. Raffles intended to remedy this state of affairs, but did little. The bazaar tolls in particular in the last year of his administration brought in a record amount to the Government. A measure of Raffles's which received much criticism at the time was his expedient for redeeming the depreciated paper currency issued by Daendels. In order to gather this in he advertised his willingness to accept it as payment for the transfer of allotments of government lands. The criticism came from the conservative section headed by Major-General Gillespie, who shows himself to have been jealous of the measure of independence and power enjoyed by a civilian in the capacity of Lieutenant-Governor of Java. His attitude was consistently one of alarm, real or pretended, at the radical nature of the changes introduced by Raffles and a professed regard for the instructions of the supreme Government. In the absence of any convincing argu-

ment to the contrary, it must be agreed that Raffles's expedient was justified first by the urgency of the financial situation, and secondly by the success with which his measure relieved it.

RESTORATION OF THE DUTCH COLONIES

Whatever hopes Raffles still entertained about the retention of Java by the British Government must have been dispelled by the publication of the Convention of August 1814 between Great Britain and Holland, by which the Dutch colonial possessions as they existed in 1803 were restored. He experienced a temporary revival of hope when the reappearance of Napoleon seemed to be about to effect a radical alteration in the international situation, but his eventual defeat dissipated all expectations that the Convention would not be carried out. The known opinions of Raffles on this subject may have been one reason for the decision of the British Government, dated May 5, 1815, to replace him by a more manageable official, John Fendall by name, whose main commission was to carry out the transference to the Dutch of Java and its dependencies.

As far as Java itself was concerned there was, except in financial matters, little difficulty. The Dutch Commissioners arrived in 1816 and the British occupation came to an end in August 1818. But the British raised difficulties about various dependencies. Fendall was at first disposed to object to the Dutch re-occupation of Banjermasin in Borneo, which he contended had been definitely abandoned by Daendels. However, after much argument, the colony was given up. There was also trouble over Billiton, which had not been expressly mentioned in the Convention but which the Dutch regarded as included under the term Banka, meaning the island of Banka and its dependencies. Both islands, Banka and Billiton, had been ceded to the British by the Sultan of Palembang, and under the Convention only Banka had to be given up in exchange for Cochin in India. The British claim to Billiton therefore seemed just enough, but in face of the determined attitude of the Dutch Commissioners the island was abandoned. It was apparent that the Dutch were anxious to establish secure claims to as much of the archipelago as possible, while the British, whose interest in this region had been by this time re-awakened, were just as determined to retain some foothold there. Raffles, from his station in Benkulen, watched the proceedings of the Dutch

Commissioners with ill-concealed anxiety. He went so far as to encourage the Sultan of Palembang in the defence of his independence and sent an armed guard to his capital. These measures proved unavailing, but Raffles was not to be baulked in his determination to wreck the revival of the old Dutch policy of excluding rival European Powers from the archipelago, and also, as a result of their possession of the channels into the Eastern seas, from the China trade. The master-stroke of his campaign was the occupation, in January 1819, of the island of Singapore, in virtue of a treaty concluded with the native prince of Johor. This aroused the anger of the Dutch, who protested strongly, and the situation became so acute that negotiations began for the conclusion of another treaty. The settlement made by this treaty and the problems subsequently arising out of it are dealt with in the section on diplomatic history (p. 523).

CHAPTER XV

HISTORY

II.—FROM THE DUTCH RESTORATION TO THE PRESENT TIME

Introduction—Java (The Java rebellion—Territorial settlement—Native jurisdictions—Culture system—General finance—Indian constitution—Law)—Sumatra (Achin)—Borneo (Sambas—Pontianak—Landak—Sukadana, &c.—Banjermasin—Kutei—The Kongsis)—Celebes (Gowa—Boni—Wajo—Luwu—Buton)—The Moluccas and New Guinea—Lesser Sunda Islands (Bali—Lombok—Sumbawa—Flores and Solor—Timor—Sumba)—Diplomatic history (Great Britain: Treaty of 1824, &c.—Great Britain and Germany in New Guinea—Portugal)—Present situation.

INTRODUCTION

WHILE the centre of Dutch rule continued as of old in the island of Java, the period from the time of its restoration to the present day is remarkable for the extension and consolidation of Dutch power in the outlying regions of the archipelago. To the Spice Islands and to one or two isolated posts in the other groups the Dutch possessed undoubted rights, but their pretensions to the other territories comprised in the vast area of the archipelago were of so vague a nature as to be challenged in places like Sumatra, Celebes, Borneo, and Bali.¹ The Treaty of 1824, between Great Britain and Holland, went a considerable way towards defining the limits of the Dutch sphere in the archipelago, and during the nineteenth century they were almost constantly engaged in establishing their sovereignty within the area thus roughly delimited. This task they were able in some cases to accomplish by peaceful methods, but, generally speaking, the period was one of constant warfare with the natives in one or other quarter of the archipelago. They were able, however, to establish over a great proportion of the area the rule of a feudal suzerain whose surveillance of

¹ The Dutch East India Company entered into 'treaties of alliance' which, while they provided for the formal recognition of the sovereignty of the Company, were chiefly concerned with monopoly of trade and levies of produce.

the native governments was regulated by treaty, and in some cases the lands came gradually under direct European administration. There were, and continue to be, certain savage tribes inhabiting the interior of some of the islands which, while within the sphere of Dutch influence as it is understood in international treaties, yet maintain absolute independence. In this way there grew up an administration varying in intensity in different localities, the direct rule, first instituted by Daendels in the greater part of Java, the feudal suzerainty as it exists in some parts of Sumatra and elsewhere, and the mere exercise of influence as in the centre of New Guinea and in similar places. The events which led up to this condition of affairs are therefore only capable of regional treatment.

JAVA

In 1816 the three Dutch Commissioners took over the government of Netherlands India, and began an investigation into the political and administrative arrangements as they had been left by the British. They found themselves faced with an exhausted treasury and a deficit bequeathed to them by the previous government. After receiving various reports from the Residents on the working of the *landrente*, they decided to retain it and later to effect improvements in its working. They were prepared to depend upon it for their main revenues and to regard commerce as a secondary consideration. Labour was to be freed from its old feudal obligations and to be voluntary, receiving a wage. The native Javanese had shown himself unable to deal directly with the Government, and it was now enacted that the village should constitute the taxable unit. This arrangement also meant a great saving in European officials, who were not too plentiful. A second change in the system was the abolition of any cut-and-dried scheme of assessment, such as had been planned by Raffles, and the substitution of the practice of bargaining with village headmen. Thirdly, the natives were allowed to pay their tax in money or kind, as they preferred. In the same liberal spirit that they had manifested in dealing with the *landrente*, the Commissioners leased the Preanger coffee plantations to the village communities, who, subject to certain regulations and the payment of rent, were allowed to cultivate the plant in their own way, and the same freedom was allowed them in the disposal of their produce.

The Commissioners set to work to improve the number and quality of their official personnel. They urged the Hague Government to discontinue the policy, which had obtained with the Company in the eighteenth century, of sending out officials of an inferior type, and demanded some standard of education and character. They also discouraged the disparagement of native officials, and frankly accepted the situation which admitted natives to a large share of the work.

In 1819 the régime of the Commissioners came to an end, and one of them, Baron Van der Capellen, became Governor-General. During his rule from 1819 to 1826 there was a noticeable tendency to revert to the colonial policy of the Company. Profit became a consideration of immediate importance, and the oppression of the native began. An exclusive policy was adopted towards strangers, especially Europeans, who were allowed to trade only when provided with permits, while only Dutch could possess land. In the territories of the native princes the leasing of the land to Europeans was forbidden. These measures were adopted possibly out of regard for the welfare of the native cultivator but it is more probable that the Government had begun to be jealous of individual enterprise. This tendency of government policy became accentuated when the colony was saddled with the expense of quelling a widespread revolt in Java, which began in 1825.

The Java Rebellion

When the Dutch were restored in 1816, Java was apparently tranquil. A regulation abolishing the practice of leasing estates in the territories of the native princes was welcomed by the natives, but when it was discovered that compensation would have to be paid to the lessees there was considerable dissatisfaction. In order to alleviate the situation the Dutch Residents in the native states arranged, in 1824, that the compensation should be paid in coffee produce of the estates in question. But apart from individual cases of oppression the policy of interference in native politics, which had begun with Daendels, and the series of measures affecting the life of the native cultivator instituted by successive European administrations, created general discontent among natives unaccustomed to change. The circumstances were propitious for revolt, and the opportunity was seized by Dipa Negara, the illegitimate

son of a former Sultan of Jokyakarta, who had aspired to the temporary position of Sultan during the minority of the ruling prince.

The rebellion which followed lasted from 1825 to 1830 and affected most of the Javanese who were not subject to the direct rule of the Dutch. Before it was finished the Dutch were employing 23,000 men, of whom 8,000 were Europeans. Casualties to the number of 15,000 were incurred, and the cost in money to the Dutch has been put at 20,000,000 guilders.

Territorial Settlement

The settlement following upon the war provided for a great diminution of the territories of the native princes. Only Sukawati, Pajang, Mataram, and Gunong Kidul were left to them. Sukawati and Pajang went to the Susuhunan, while the Sultan retained Mataram and Gunong Kidul. The provinces of Madiun and Kediri in the east and Bagelen and Banyumas in the west, were at this time brought under the direct rule of the Dutch. It was hard to convince the princes who had loyally supported the Batavian Government that this was an equitable proceeding, and it was deemed expedient in the case of Jokyakarta to pay an annual indemnification of 182,000 florins. The settlement bore with extreme hardness on the Susuhunan, who had from the first supported the Dutch cause, and as a consequence of his suspicious movements he was arrested and banished to Amboina. From 1830 onwards the native princes of Java ceased to be of any political importance.

Madura.—Madura was by degrees brought under direct Dutch rule. The Sultan of Bangkalan from 1815 to 1847 ruled in an arbitrary and wasteful manner, and on his death his successor was given the inferior rank of *Panambahan*. In 1863, when the second Panambahan was appointed, the Dutch took from the native government the administration of taxes, and many injurious impositions, levied by the Chinese ‘farmers’ on the trade and industry of the island, were abolished. The prince was compensated for the loss of this privilege, and his regency was divided up for administrative purposes into eight districts. In 1858 Pamekasan became an ordinary regency, and in 1885, through default of heirs, it was possible to bring the other two provinces of Madura—Bangkalang and Sumenep—under the

direct government of Batavia. They now became regencies, and the exercise of power and the holding of lands by princes other than those who acted as government officials were prohibited.

Bantam.—In Bantam the abolition of the Sultan's rule had provoked unrest among the nobles who objected to the diminution of their own powers. At intervals from 1822 to 1850 there were serious outbreaks of which the last were the worst. In 1872 a priest from Mecca formed some sort of religious association the members of which in 1883 ravaged the whole province of Bantam, and were responsible for the destruction of fifty-one villages besides the partial ruin of many others. A contributory cause to the outbreak lay in the measures adopted by the Government to deal with a cattle plague. The unrest had spread to Central Java where there were religious outbreaks, and the rising was not put down until 1888 when troops were dispatched for the purpose from Batavia.

Native Jurisdictions

The power of all the princes has suffered a constant diminution, chiefly owing to the spread of the European judicial jurisdiction. The native jurisdictions were restricted to those of Surakarta, Jokyakarta, and that exercised by the Pangeran Mangu Nagara and the Panambahan of Bangkalan. The subjects of Paku Alam were included in the Jokya Sultan's jurisdiction. This latter did not extend to penal cases, which were tried by the Resident, as was the case with the native jurisdiction on Madura. Here the important civil suits also fell within the judicial province of the European officials. In all cases the powers of the native princes could only be exercised over their own subjects, and where one party in a case was an alien the law administered by the princes was not applicable, and resort had to be made to the European tribunal.

Culture System

The policy of the Dutch Government towards the Javanese under its direct authority underwent a drastic change in 1830. The liberal movement which aimed at freeing the cultivation and trade of Java which had been inaugurated by Raffles ended with the departure of Governor-General Du Bus de Ghisignies.

For some time the Government at the Hague had been in straitened circumstances, and was alarmed at the prospect of being compelled to bear the additional burden of the maintenance of a struggling colony. Governor-General Van den Bosch, who began his rule in Java in 1830, instituted the economic policy known as the Culture System. This system was an attempt on the part of the Government to direct and stimulate production in Java with a view to supplying the demands in European markets, thereby ensuring a large profit to the State. Instead of depending for its revenues on the taxable capacity of the native, the Government intended to commandeer a proportion of his land and his labour time, both of which would be employed under official direction. In practice this system, at the period of its widest application, affected only 5 per cent. of the whole agricultural area. But it achieved its immediate purpose in producing a large revenue surplus for the benefit of the mother country, and it is admitted by a severe critic that if it had been administered in the spirit proposed by its founder, it might have proved beneficial to the native Javanese. But the demands of the Home Government grew so heavy that the defects of the Javanese administration, apparent under the best policy, were now accentuated. The resources of the Government tended to be concentrated on the culture areas, and here the officials lost their character as servants of the State and took on that of commercial agents. Meanwhile, in the other districts, there was a lack of vitality in the administration, and the principle of taxation suffered accordingly. Another valuable principle was sacrificed to the desire for profit when the remuneration of the native regents by grants of land was revived, a practice bringing in its train the old feudal customs which had already been condemned. The paramount considerations of producing in accordance with the requirements of the State led not only to an encroachment upon the property and labour of the cultivator, but also to interference with the village custom governing land tenure. The disposal of lands and the distribution of labour necessary to carry out the government cultures had the effect, in some localities, of extinguishing individual private property and of substituting property held in common. The great evil of the system was that in the hands of rapacious officials, both European and native, it often absorbed so much of the land and

labour of the cultivator that he had little opportunity of providing himself with the means of subsistence.

The reform of the culture system came eventually from Europe. In 1848 the Fundamental Law democratized the Dutch Legislature and gave it some measure of control over the ministry. In 1854 the *Regeerings Reglement*, framed in accordance with the constitution of 1848, expressed itself generally on the objects of Dutch colonial government, and besides the obvious provisions connected with slavery, freedom of the press, and the education of the natives, contained several injunctions as to the working of the culture system. These were chiefly directed at safeguarding the interests of the natives, but did not as yet suggest the abolition of the system. The Agrarian Law of 1870, however, while permitting government cultures, safeguarded native rights, and encouraged the enterprises of individual Europeans. Many of the lesser cultures had already been given up, while others more important were allowed to linger on to survive as best they could against individual enterprise.

General Finance

The Culture System constituted only a part, although a very important part, of the colonial fiscal system. In 1864 the *Comptabiliteitswet* provided that the budget of Netherlands India should in future be fixed by a law passed by the Dutch Government. This did not affect the arrangement by which the home authorities received the surplus revenue, and payments continued to be made until 1878, when as a result of the expenditure on the Achin War the contributions ceased. Although the possibility of such a contribution has not yet been lost sight of, its lapse seems to have had the effect of encouraging expenditure on public works, an item which has trebled in amount since 1870. In a lesser degree the same increase is to be observed in the expenditure on provincial administration and on the collection of revenue—a sign that the Government is devoting more of the resources to the execution of the purely State functions of justice and taxation.

For revenue the Government still depended on the two cultures of sugar and coffee. A law in 1870 provided for the gradual abandonment of sugar cultivation, and by 1890 the transition from government to individual control had been

completely effected. In spite of proposals made from time to time to relinquish coffee cultivation the Government continued to retain the control of this industry, although in the last decade of the nineteenth century the extent of the culture has considerably diminished.

Some progress has been made towards the substitution of taxation for forced services, and although labour services, as part of the payment of officials, has almost entirely disappeared, general and communal services are still exacted, subject to numerous government regulations. The old *landrente*, originally imposed by Raffles, had persisted in these parts of Java not devoted to the government cultures, and, indeed, had been sometimes levied in addition to the culture services. In those parts where it had been the main service of revenue, it had survived in a very corrupt form through the absorption of the Government in the cultures. The abolition of the latter directed attention to the defects of the tax, and, in 1872, a law was passed, by which it was attempted to levy the tax on the principle of different assessments for different qualities of land, with a normal assessment of one-fifth of the produce. This law is stated to have been of no effect in practice, and the old system of bargaining between the Government official and the village headman still persisted. Another tax of importance was the poll-tax imposed for the purpose of providing salaries of native officials, hitherto remunerated by the feudal services of their tenants.

Indian Constitution

The Fundamental Law of 1848, by which the Dutch Legislature gained a measure of control over colonial policy, was the prelude to the framing of the Indian Constitution of 1854. This Act served mainly to give legal effect to institutions that had grown up under the Company, as they had been reorganized under the administrations of Daendels and Raffles. It established the relationship between the Home Government and the Governor-General in India, between the Governor-General and his Council, between the executive and the judiciary, and between the European and native governments, with other important provisions besides. These relations, with certain important amendments, have persisted until the present time, and they are treated more fully in Chapter VIII on 'Government and Administration'.

Law

The Reglement of 1854 also formulated the principles governing the law of Netherlands India, and a brief survey of the history of the development of law is of interest. The first code was promulgated in 1642 and was known under the title of Statutes of Batavia. This code applied to all the settlements of the Company. It was not until 1761 that the laws issued subsequently to 1642 were collected under the name of the New Statutes. This collection was never promulgated, but they and the Batavian statutes had force of law. In the drafting of these enactments it had been the practice to consult Roman law and that of Holland, which itself is described as a hotch-potch. Daendels was responsible for these laws which prohibited sentences in native courts involving the Mohammedan practice of amputation, and in 1809 a decree forbade 'afflictive' punishments. These regulations were later confirmed by Raffles, who also introduced a kind of native jury, an innovation which has been subjected to much adverse criticism. The Commissioners-General organized the High Court and contented themselves with the regulation of procedure in the civil and criminal jurisdiction, both European and native, making no serious alterations in the law itself. In the alterations they effected they were guided by the old Dutch practice, which they preferred to the reformed procedure introduced just previously into Holland. Although intended as only temporary measures they continued in effect until 1848. As early as 1830 there was a movement for the reform not only of the French system in Holland but also that in vogue in the Indies; by 1846 there had been drawn up the general principles of legislation, the civil code, the commercial code, and the laws of bankruptcy, and during the two following years various acts regulated the civil and penal procedure of the High Court, and the Councils of Justice in Java and Madura, the functions of the police and the procedure, civil and penal, in the native courts. This and other legislation drafted at the same time was introduced in 1848 and became the basis of society in Netherlands India.

SUMATRA

Of the ancient history of Sumatra there is practically no reliable evidence, but a number of political societies were

formed by the Malay race in the region now known as the Malay Peninsula on the east coast, and in the centre of Sumatra. The earliest known influence to which these kingdoms were subject was that of the Hindus, who are said to have maintained a regular connexion with their colonies in Java, and apparently managed to impart much of their civilization to the Malay societies on both sides of the Malacca Strait. It is probable, however, that Hindu ideas spread in Sumatra chiefly through immigration of Hindu-Javanese and the ever-extending sway of the empire of Majapahit.

There were, however, other influences at work. There is record of a commercial intercourse with Arabia as early as the ninth century, and about this time political troubles in China diverted much of the Arab trade to other markets for eastern produce, among which was Palembang. Towards the end of the twelfth century Arab missionaries began to arrive, and in 1205 they achieved what was probably their first triumph in this region, the conversion of the Achinese. It was not long before Malay States on both sides of the Malacca Strait followed suit, and the spread of the new faith to Palembang was fraught with much consequence to the empire of Majapahit. The fall of Majapahit, which occurred towards the end of the fifteenth century, caused the break-up of the old empire and the assumption of independence by its Sumatran vassals, and the States thus formed were estimated to number twenty-nine.

Under this new political order the difference between political societies in the east and those in the west is noteworthy. The east coast bordered on the main thoroughfare of eastern civilization and in consequence became permeated with influences from India, China, and Arabia. Not least important among these was the genius for political organization, which resulted in the formation of a number of powerful States with their capitals at the mouths of the rivers flowing into the Malacca Strait. This influence in some degree penetrated to the western side of the island, where the State of Menangkabau was established. It is not clear to what pitch of political organization or power the State of Menangkabau attained, but the effort eventually spent itself without having made any lasting impression on the small Malay communities of villages and village groups of western Sumatra. Another attempt to weld these numerous local organizations into a compact political unity was

made by the kingdom of Achin in northern Sumatra, but again the attempt broke down after a temporary success. Achinese influence, however, took a permanent hold of several communities in the north, but, generally speaking, the Malays of the west coast remained split up in societies which rarely attained to an organization greater than the village or group of villages.

The difference between the two stages of political development of the peoples of these two regions is reflected in the Dutch administration of to-day. The western coast of Sumatra is susceptible only of direct administration by the Dutch, while many of the States with a well-developed political consciousness on the eastern side still retain a measure of self-government.

These independent kingdoms constituted the chief obstacle to the extension of Dutch rule in Sumatra. But they were successively brought under either direct rule or suzerainty. In 1825 the Palembang Sultanate was abolished and the Dutch next moved on to Jambi, where successive Sultans gave considerable trouble which has only abated in recent years. Both kingdoms are now subject to the direct rule of the Dutch. Less trouble was experienced with Siak Sri Indrapura, still farther to the north, by whom Dutch suzerainty was acknowledged in 1858. The original vassals of Siak Deli, Asahan, Kuala, Serdang, and Pelalawan, as a result of the rapid economic development of their territories, became of much more importance than the suzerain State, and subsequently made independent agreements with the Dutch Government.

On the western side of Sumatra the Dutch had less difficulty. The empire of Menangkabau possessed spiritual prestige only, and during the 'holy war' of the Padri sect, which began in 1807 and was finally stamped out by the Dutch in 1837, the old Malay kingdom disappeared. The Dutch had now to deal only with a vast number of village communities included in the regions of Benkulen, Padang, Padang Highlands, and Tapanuli. During the nineteenth century these were annexed piecemeal, and direct rule substituted.

Dutch rule had by this time come in contact with the Batak peoples dwelling in the region round Lake Toba, and since the middle of the nineteenth century up to within recent years have taken successive Batak territories under their rule.

Achin

The most serious native opposition to the supremacy of the Dutch in Sumatra has centred in the northern territory of Acheh (Dutch *Atjeh*, better known in history as Achin).

Chinese accounts refer to the existence of a Hindu Malay Kingdom in the extreme north of Sumatra in the sixth century, and this region seems to have been an intermediate station for Hindu intercourse with Java. In and after the ninth century it became a port of call for Arab traders on their way to the East, and eventually in the fourteenth century it provided a convenient field for Mohammedan missionary endeavour. The Portuguese policy of monopoly which they endeavoured to enforce on both sides of the Malacca Strait drove many Oriental traders to Achin, which rapidly became the wealthiest and most powerful kingdom of northern Sumatra, and extended its suzerainty considerably beyond its own frontiers in the island, and even over territory in the Malay peninsula. Its ascendancy, however, was not of long duration, and in the seventeenth century the Dutch East India Company, after repeated blockades, extracted promises of a trade monopoly in Achin itself, half the tin product of Perak, and permission to build a store at Padang (1659). A force of 300 Dutch drove the Achinese from Indrapura, over which they had extended their sway, and by means of the policy of seducing the States of the west coast from their allegiance, the power of Achin was soon confined once more to northern Sumatra.

Throughout the eighteenth century Achin was rent by the rivalry of the Governors of the *sagis*, or inland provinces, with the Sultans, who had been restored in 1699, but under humiliating restrictions. Their chief influence was exercised at the capital on the coast, and they had the support of the Arab priests. Constant civil war and devastation brought the kingdom to a low condition, and it was the opinion of Raffles, when writing to Lord Minto in 1810, that Achin would eventually split up into a number of pirate States. During the English régime the Sultan was friendly, being the son of a Penang merchant, and Raffles secured from him a treaty granting the monopoly of trade and arranging for a defensive alliance. The effect of this was to a great extent nullified by the expulsion of the English ally by the Governor of *sagi* Mukim XXII.

The Treaty of 1824 between Holland and Great Britain, which arranged for the abandonment of Sumatra by the latter Power, included an appendix in which it was agreed by the Dutch that the independence of Achin should be respected. But the gradual expansion of Dutch power on the west coast of Sumatra was destined eventually to bring them into conflict with the nation whose integrity they had thus bound themselves to respect.

An attempt in 1829 to occupy Tapanuli Barus was frustrated by the Achinese, and in 1831 an Achinese fleet assisted the Padris against Ayerbangis and Natal. Meanwhile, acts of piracy brought American and Dutch warships on punitive expedition against the Achinese of the west coast. The Rajah of Trumon had in 1830 made a treaty with the Dutch Resident, but this was never confirmed. He was once a vassal of Achin, but was then regarded as independent. However, Van der Bosch apparently thought that this would be an infringement of the treaty of 1824 and fixed the limit of Dutch expansion at the Singkel River (1833).

It was not until 1839 that Barus fell into Dutch hands, and in the following year a treaty was made with the Rajah of Trumon, in order to use his kingdom as a buffer state between Dutch West Coast possessions and Achin. Numerous acts of piracy were committed by the Achinese, both of the suzerain kingdom and its vassals. In 1855 the practice of sending warships was begun. This alarmed the Sultan, and he wrote to Singapore for advice which he received to the effect that he should enter into friendly relations with the Dutch. In 1857 General Van Swieten concluded a treaty with Sultan Ibrahim Mansur Shah, by which all previous disputes were to be forgotten, the Sultan was to suppress slavery and piracy, and the Dutch were to be admitted to the trade of Achin on the same footing as the most favoured nation.

Within a few years of the signing of the treaty new problems arose. It was not long before the Dutch had to make the usual complaints about piracy, but the chief trouble was connected with Dutch aggrandizement on the east coast, where, in 1858, Siak and its dependencies as far as the Tamiang River came under Dutch suzerainty. This new acquisition included territories which had once been tributary states of Achin, and over which the Achinese were renewing their influence. In 1863 an

Achinese fleet bombarded Deli, Asahan, and Serdang, and fired on the Dutch flag at Batu Bara. When asked for explanations, the Sultan said that Batu Bara (included in the recent annexations of the Dutch) had refused tribute and he was unaware of the presence of the Dutch flag. He also claimed the east coast as far as a point well south of Asahan. Reprisals were instituted by the Dutch in this region.

The continual acts of piracy convinced the Dutch Government that it would have to take measures which would possibly involve a diminution of Achinese independence. For this purpose the necessary liberty to exercise a free hand in Sumatra was obtained from Great Britain in the Sumatra Treaty of 1871.

The activity of the Dutch warships warned the Sultan of Achin of his impending danger, and he began to cast about for allies among the European Powers. He approached the Straits Government and demanded assistance under the terms of Raffles's treaty. He was told that this was not then valid, and he was advised to become friendly with the Dutch. He also intrigued with Turkey, France, Italy, and America, and the Consul of the last-mentioned country went so far as to draft a treaty. The Batavian authorities were now thoroughly alarmed at the prospect of foreign intervention in Sumatra, and in 1873 the Vice-President of the Council of India went to Achin as commissioner of the Government. He was followed immediately by an expeditionary force of 3,600 men. No satisfaction was obtained, and in April 1873, the troops landed east of Oleh-leh.

The first expedition failed to achieve its immediate object which was to take the *kraton* at Kuta Raja. A blockade was then instituted pending the preparation of a further expedition, and efforts were made with the object of seducing the rajahs of the Achin dependencies from the cause of Great Achin. This succeeded in a few cases only. In December 1873 General van Swieten landed a strong force and captured the *kraton*, which he found abandoned (January 1874). The importance of the capture of the *kraton* was over-estimated by the Dutch. The history of Achin showed that the Sultan only in a small measure represented the power of the people over which he ruled. Apart from a strong feeling of local independence, militant Mohammedanism preached by Arab *ulamas* was more common in Achin than in any other part of Netherlands India.

The Dutch nevertheless hoped that the capture of the capital would make the natives amenable to peaceful persuasion, and consequently Van Swieten, who in January 1874 had become Governor of Achin, and those who came immediately after him, tried a waiting policy and were content with the possession of Kuta Raja. So far from inducing the Achinese to submit, this policy encouraged the highland natives in the belief that the Dutch were afraid to attack them, and the opportunity was used to foment a holy war. When this was realized it was resolved by the Dutch to cut off Great Achin from the sea, and to this end the conquest of certain island districts was deemed to be necessary. When this was accomplished conciliatory methods were again tried. But hostilities by the Achinese under their leader Habib Abdurrahman induced General Van der Heyden to undertake the conquest of the whole Achin valley. Within three months, by September 1879 all opposition was at an end, and the native leaders had surrendered.

For the ensuing twelve months there was complete tranquillity throughout Great Achin. In 1881 a civil governor was appointed ; peace tactics were actively pursued, and the army was condemned to inactivity. Again the *ulamas* and leaders of the Achinese guerilla bands took heart and made spasmodic attacks on the Dutch posts. The chief native leader was Teuku Uma, a famous adventurer. By 1883 the situation had become impossible from the Dutch point of view, and a new policy was considered. In 1883 it was decided to restore the Sultanate, but after a fruitless attempt the idea was abandoned.

In 1884 in a secret session of the States-General it was agreed that the best plan under the circumstances was to withdraw from the posts in the interior of Great Achin, and establish a fortified zone with Kuta Raja as the head-quarters. The new position was defended by a circle of military posts, which were connected with one another and with the head-quarters by railway and telephone. The policy was one of armed defence against an enemy whose attack was not to be provoked but awaited. The enemy meantime attained to some degree of organization under the leadership of Teungku Tiru, who had established himself in the *sagi* of Mukim XXII. A holy war was proclaimed, and raids of the guerilla bands were conducted systematically, while Teungku Tiru organized a reserve force. These raiders even made their way inside the fortified zone,

where they destroyed telephone and railway communications. The whole of Achin and its dependencies as far south as Tamiang and Langkat were affected by the new movement. Tuanku Muhamat Dawot, being now of age, was crowned Sultan at the mosque of Indrapuri.

The only reply on the part of the Dutch, except for a few isolated sallies, was to complete the measures for the defence of the zone and to endeavour to open negotiations with the new sultan. The blockade which had been allowed to lapse was nominally tightened, but it is said that this system was not carried out thoroughly, and further, the Achinese were practically self-supporting, and not likely to be seriously affected by a blockade.

The investigations of Dr. Snouck Hurgronje in 1891 and 1892 revealed the fact that a peaceable compromise with the extreme party was impossible and that they could only be reconciled to Dutch rule after a complete defeat. He was also of the opinion that the sultanate could be disregarded as of no political significance. He advocated the promotion of agriculture, industry, and trade, coupled with a vigorous offensive against the extreme party.

This policy was not at once adopted. The governor shrank from incurring the expense and responsibility of an offensive. Instead, Deykerhoff bribed some of the Achinese chieftains to carry out the work of suppressing guerrilla bands. The most successful was Teuku Uma, who, with a force of 250 men maintained at Dutch expense, cleared the *sagi* of Mukim XXVI, and in 1894 took the villages of Anak Gelong and Senenlop. Most of the garrisons of the inland posts were supplied by Teuku Uma. The latter had insinuated himself completely into the confidence of the governor and had received large supplies of ammunition, when he suddenly turned traitor. In order to prosecute the campaign against Teuku Uma, to whom support flowed from all parts of Achin, it was found necessary to withdraw what Dutch troops were being used to garrison outlying posts.

The rebel chief was gradually driven from one position to another and a heavy blow was struck by the capture of Anak Gelong. New head-quarters were established at Indrapuri, and local bases at Lhas Nga and Jot Manjang. The tactics of sending small patrols to destroy individual guerrilla bands was adopted with success. From the three centres above mentioned

mobile columns operated in each locality for the purpose of keeping the regions clear of the enemy bands, and it was decided to link up the three positions with a steam-tramway. In order to maintain a stricter surveillance of a population which, while nominally agricultural, was accustomed to become suddenly militant when Teuku Uma appeared in the locality, the regulation that no native could bear arms without a pass was imposed throughout Achin. In January 1898 Teuku Uma was driven out of Achin and took refuge with Panglima Polem in Pidir.

Pidir now became the centre of the opposition to the Dutch. In March 1898 Van Heutsz was made civil and military governor of Achin, and during the remainder of that year a vigorous campaign was instituted against the enemy positions in Pidir, a great many of the chiefs being captured. Heavy fines were inflicted on the States of the east coast and these were exacted in the form of levies on the pepper produce. During these operations there was a local religious upheaval under the fanatic Tapa who made his head-quarters at Idi. Teuku Uma was pursued to the west coast where, in February 1899, he was ambushed and slain.

The death of Uma did not have the expected effect on the political situation in Great Achin, which owing to the refractoriness of Panglima Polem, the *sagi* chief of Mukim XXII, was still unsettled. By this time, however, the Dutch regulations relating to registration, bearing arms, prohibition of dry rice cultivation, living in the mountain villages, and offences against public security, were now beginning to restrain the forces of disorder. Roads and bridges were built by the natives under the instructions of the Dutch, and telephonic communication was established with Pidir.

In these districts the enemy was still in force under the leadership of Sultan Dawot, Panglima Polem, and other chiefs. In 1899 Dutch expeditions dispersed the main body and the remnants were pursued along the north coast, where their resistance was strengthened by another fanatical outbreak of the followers of Tapa. In spite of this the Dutch troops crossed the Pasei River and stamped out the local resistance. In the conquered regions fines were imposed and taxes levied to pay them. A road was constructed from the west coast to the east, where at the River Jambo Aje it joined up with the road which

ran south to Kuala Simpang in Tamiang. Along this road Governor Van Heutsz in the autumn of 1899 rode in triumphal progress, inflicting fines and other punishments on the States of the east coast as he proceeded. The subjugation of what was for the Dutch virgin soil considerably strengthened their *moral*, and depressed that of the enemy. A similar policy was adopted towards the chiefs of the west coast and many fines in the shape of extra duties were inflicted. By 1900 nearly all the district chiefs had surrendered. During 1899 the basis of Dutch relationship with native rulers was restricted to a contract of three articles, the 'short declaration', which diminished their independence.

The next focus of resistance was Samalanga, where the local chief and Sultan Dawot were in command. The local chief surrendered and was reinstated conditionally, while Sultan Dawot, in 1902, was driven into Gajo Land and eventually into Pidir. Early in 1903 the Sultan gave himself up at Kuta Raja, where he acknowledged the sovereignty of Holland. He was compelled to instruct the local chiefs to desist from further opposition.

The effect of the Sultan's surrender was not great, and the people, who had always respected the Sultan but seldom obeyed him, were much more susceptible to the influence of the *ulamas*. In Pidir especially disorder was rife.

In September 1903 Panglima Polem, chief of *sagi* XXII, surrendered, and this conduced to a better state of affairs in his province, to which he was restored as governor. Many of the north-coast chiefs followed his example, and the resistance of a few leaders who had fled to Gajo Land was broken by the expedition which pursued them there. The conditions on the west coast were not so satisfactory, but generally the situation was considered so favourable as to warrant a development of commercial and municipal enterprise in Kuta Raja.

The effect of Japanese victories over the Russians was to give fresh life to the native opposition. Both the Sultan and the *ulamas* entered into secret negotiations with the Japanese with a view to securing an alliance and munitions of war. During 1905 and 1906 disorders broke out and were suppressed, and in 1907 a conspiracy was formed to restore Sultan Dawot. He and his supporters were arrested, their treason was proved, and they were banished to Batavia. Throughout this year there

were several outbreaks in Achin itself, and increased enemy activity in the dependencies.

In November 1907 Governor-General Van Heutsz visited Achin and instituted a conciliatory policy. Many of the fines were abolished and the restrictive regulations and military control were relaxed. In this year also systems of taxation and education were introduced. The religious party was to be annihilated while the native Government was to be diverted from the ignorant chiefs to their sons educated outside Achin. National education was instituted to neutralize the influence of Mohammedanism, and a Government Bank to assist agriculture. Many other improvements were effected in Great Achin, and these began to have an influence on the neighbouring States. But the dependencies were far from being pacified, and in Pasei especially, throughout 1908, attacks were made on the tramway and on government buildings.

In June of that year H. Swart became Governor, and he succeeded in ingratiating himself with the natives and their chiefs by his respect for the native law and his lenient treatment of offenders. It was still necessary, however, to pursue and destroy *ulamas* and the leaders of guerrilla bands. By February 1912 most of the rebel leaders had been accounted for, and although attacks on government works and officials are liable to continue¹ the country is gradually assuming a permanently settled condition. It is still necessary, however, to maintain a garrison of about 5,000 men in Achin, and the expenses of government amount to five times the revenue.

BORNEO

In the following account of the history of Borneo mention is made only of the more important political organizations situated round the coasts and of pure Malay or Hindu-Javanese origin. They are those with which the Dutch have had a long and fairly regular intercourse as testified by successive contracts in the old form which in most cases are still in vogue. Other States, whose relationship with the Dutch is of more recent date, are mostly bound by the new 'short declaration'.

¹ The *Kolonial Verslag* of 1915 reports various attacks by armed bands.

Sambas

Early in the seventeenth century Sambas was ruled by a Malayan prince as the representative of the Sultan of Johor. With this prince the Company, in 1609, concluded a treaty by which it gained a monopoly of the diamond supply, and all other Europeans were denied access to Sambas. The non-fulfilment of the contract by the prince resulted in the closing of the factory in 1623, and although relations were not altogether broken off there was no important intercourse for a considerable time. After the death of the Malay prince, the Government fell into the hands of a prince from Brunei who had married a princess from Sukadana. The seat of government was removed to Labuk Madung and has since remained there.

Towards the end of the eighteenth century the chief menace to the Sultan's power was the growing strength of the Chinese. These at first paid their taxes to the Sultan, but, as they grew more powerful, withheld them. In 1770 they murdered the Dayak chiefs who had been set over them to govern on behalf of the Sultan. Under a later Sultan the Chinese not only refrained from paying taxes, but supported a rival claimant to the throne in the person of the Sultan's younger brother. This faction became responsible for the organized piracy which had its centre in Sambas, and later, when the brothers had been reconciled, the Sultan himself became involved. Pangeran Anom, the younger brother, grew to be such a formidable danger to commerce that the British, during Raffles's régime, fitted out an expedition which had the support of the Sultan of Pontianak. This expedition failed, but a subsequent attempt to destroy the pirate stronghold was successful. The Sultan was pardoned and allowed to continue in power, while Pangeran Anom succeeded in making his escape.

On the Sultan's death in 1815 the British were content to recognize Pangeran Anom as his successor. When the Dutch were restored the new sultan sent an embassy to Batavia, and in 1818 a Dutch resident and garrison were installed at Sambas, which was now ruled as a fief of the Netherlands Government. New contracts were made in 1828, 1848, 1866, 1877, and 1879, the last of which was only revised in 1909.

Apart from the Chinese rebellion (dealt with on p. 502) the Sambas Government has been constantly troubled by the

Dayaks of Seribas and those of Sarawak. More recently, the Dayaks of Songkong on the borders of Sambas, Landak, and Sanggau, in spite of reprisals, were guilty of head-hunting in Sambas territory. Their final subjugation was accomplished by forces from Landak and Sanggau (1899), and they now yield homage to the Sultan of Sambas.

Pontianak

In 1772 Abdur Rahman, the Arab governor of Mampawa, founded a colony near where Pontianak now stands, and the new settlement soon developed into a flourishing trading town. In 1778 the Sultan of Bantam abandoned his claims upon the colony to the Company, which concluded a treaty with Abdur, now Sultan of Pontianak and Sanggau. Abdur Rahman's attempts to control Sanggau failed, as did all subsequent attempts. In Mampawa Abdur was more successful, and his descendants endeavoured to obtain an acknowledgement of the supremacy of Pontianak from the States of Landak, Tajan, and Matan, but never succeeded in exercising any influence there or even obtaining satisfactory recognition. After their restoration in 1818 the Dutch made separate treaties with Pontianak, Landak, and Matan, and when the claims of Pontianak to Tajan had been abandoned, a treaty was made with that place also. In the treaty made with Sultan Kasim of Pontianak the prince placed himself under the protection of the Dutch, and agreed to a joint government and control of the revenues. On his death his successor gave up most of his taxes for a fixed salary. A treaty of 1855 made the territory amenable to Dutch jurisdiction, and included it in their police system. During the reign of Sultan Yusuf (*d.* 1895) the system of taxation and statute labour was reorganized. The contract with the Dutch Government was revised in 1911.

Landak

Once a dependency of Majapahit, Landak, under the name of Augrah-batur, was for some time independent after the fall of that power. It then came under the supremacy of Matan, and, later, Bantam. In 1778 the Sultan of Bantam transferred his rights to the Company, who started a post at Ngobang, abandoned in 1791. In 1818 a small garrison was again placed

there, and in 1822 the Government acquired by contract the right over the gold and diamond mines. These, however, were worked at a loss, and were soon given back to the prince. In 1829 the garrison was withdrawn. Subsequently, treaties were made in 1831, 1844, 1859, and 1883, in the last of which concessions were granted to the Dutch for mining and agricultural development. A further treaty was made in 1909.

Sukadana, with Matan and Simpang

The original kingdom of Sukadana is said to have been a Hindu-Javanese colony founded by a prince of Majapahit. In the first half of the seventeenth century it is probable that its ruler recognized the supremacy of Mataram, but he himself obtained a temporary sovereignty over Sambas, and during his reign there was a considerable development of commerce in which the English largely participated. About 1700 the Dutch East India Company, which was jealous of the English predominance in Sukadana, seized an opportunity afforded by a joint attack by Landak and Bantam (the war had originated in a quarrel between Landak and Sukadana over a famous diamond) to destroy the English establishment at Sukadana. For a short time Sukadana and Landak became vassal provinces of Bantam, but in 1778 Bantamese pretensions to Sukadana were yielded up to the Company, and in 1786, at the instigation of the Sultan of Pontianak, a joint attack was made by the Dutch and himself on Sukadana. The town was found deserted, and was totally destroyed. The independent kingdom of Sukadana was now at an end, and its former princes now ruled over Matan, previously a dependency. The trade which hitherto had been attracted to Sukadana was now diverted to Pontianak, where the Company was able to control it.

Attempts on the part of the Dutch to rebuild and repopulate Sukadana were of no avail. The deserted town served merely as a habitation for bandits and pirates, whom it was found impossible to control. Meanwhile, in Matan affairs were falling into disorder, the country being divided into two factions—one headed by the Sultan and the other by his step-brother. Both princes, along with the chief of Simpang, took part in the piracies of which the chiefs of the west coast were guilty.

In 1822 the Dutch made an effort to come to terms with Matan and Simpang, from whose princes they extracted a

promise to refrain from piracy. But as this was subsequently broken an armed expedition under a Siak prince proceeded from Sambas and opened negotiations with Matan. Both princes of Matan and Simpang gave up their kingdom, to receive them back from the Netherlands Government. The Government's rights to old Sukadana, originally received from Bantam, were now asserted, and the Karimata Islands also became government territory. The collection of taxes by the Dutch, who were to pay compensation, and the suppression of piracy were arranged for in the treaty, which became the basis of Dutch relationship with the two native States.

In 1827 a Dutch ship which had stranded on the Karimata Islands, still regarded by the Sultan of Matan as his property, was claimed by him, and when it was refused, he attacked the local chief and carried off the Dutch flag. The Siak prince, Rajah Akil, was sent with a punitive expedition to Matan, and after some hard fighting reached the capital, which he found deserted. The Sultan had fled inland.

On his death, in 1829, a successor was appointed with the title of *panambahan*, the sultanate thus coming to an end. Rajah Akil had been made Sultan of old Sukadana with a capital renamed New Brussels. His new dominion included the direct rule over Karimata Islands and suzerainty over Matan and Simpang. Rajah Akil, however, proved an unsatisfactory ruler, who quarrelled with native princes and his Dutch colleagues, and in 1831 he was temporarily recalled. A garrison was stationed in New Brussels and subsequently, in 1834, an agent and five police-superintendents were appointed. In Matan two princes successively refused to co-operate with Akil, and in 1837, after a period during which Matan was without a ruler, they returned to their duties. A solution of the difficulty was found by which Matan, and later Simpang, became independent of Sukadana.

In 1849 Sultan Akil was succeeded by his son who received the title of *panambahan* instead of Sultan. The princes of Matan and Simpang since their liberation from the control of the Siak dynasty have behaved peaceably and have continued loyal servants of the Dutch, who have seldom been called upon to interfere in their affairs. Sukadana and Simpang are bound by the 'short declaration', and Matan by a contract dated 1911.

Banjermasin

The kingdom of Banjermasin probably originated as a Hindu-Javanese colony, and in 1365 it is mentioned as a possession of Majapahit. In 1606 the Dutch made a commercial treaty with the Mohammedan Sultan, and pepper, gold-dust, and different kinds of wood were the commodities loaded in the Company's ships. This intercourse, owing to the hostile attitude of the natives, came to an end in 1669, and the English became predominant in the trade of the port. But they also, in 1707, were attacked and massacred, and no European traded with the place for some time.

The Sultan was now anxious to renew relations with the Company, and in 1733 the latter promised their protection in return for the monopoly of pepper with the exception of one junk voyaging once a year to China. The exception was so abused as to menace the monopoly, and in 1747 it was abolished by Van Imhoff, who two years later opened a store at Banjermasin. In 1787 the Sultan, a usurper living in the new capital of Martapura, ceded his kingdom to the Company and received it back from them as a fief. A certain small tract of territory became the sole property of the Dutch, but in 1809 the place was abandoned as unprofitable, by Daendel's orders. During the régime of Raffles, Hare was Resident at Banjermasin and his term of office is remarkable for an attempt made to plant a colony of 5,000 natives.

For some considerable time after their restoration the Dutch remained on good terms with Sultan Adam. In 1826 he ceded to them his possessions on the east coast, and the Batavian Government acquired the right of nominating heirs to the throne and the subordinate regents. An exercise of this prerogative plunged the kingdom in turmoil. For some years before the old Sultan Adam's death the Dutch intrigued to establish as his heir a prince who was generally unpopular. Their chief motive seems to have been the desire for the possession of certain coal mines. In 1857, when the Sultan died, the Dutch nominee was installed, and immediately the factions of other candidates began a revolt in which they had the support of the priests' party. In spite of the banishment of one claimant the disturbances still continued and it was determined to annex the kingdom.

The proclamation in 1860 of the annexation caused further outbreaks, and for five years the Dutch were at war against refractory chiefs. Even then the rebellion still smouldered in the highlands, and in 1870 there was a further serious outbreak which was suppressed after the death of its leader. In 1883 a descendant of the Sultan dispossessed in 1787 attacked a Dutch post in Upper Dusun, and after being driven from their headquarters his followers continued to infest the hills, but without seriously disturbing the peace.

Up to this time no attempt had been made by the Dutch to penetrate into the district of Upper Dusun, it being tacitly agreed that the government inspectors should stop short of that place. In 1900, however, expeditions proceeded up the Rivers Barito, Laung, Suku, and Babuat, and friendly relations were established with the local chiefs and inhabitants. The extension of Dutch influence was made at the expense of the native authorities of the coast, who made frequent protests of which no notice was taken.

The famous mounted police were in 1905 sent to deal with the numerous acts of brigandage, and the death of the prince who had taken to the hills led to numerous surrenders. Many chiefs were banished and tranquillity was restored.

Kutei

Although visited by the Company's ships and having occasionally entered into relationship with the Dutch through the medium of Banjarmasin, the first direct negotiations with Kutei were instituted by Müller in 1825. As he was assassinated at this time, the settlement was not made. Later, when the Dutch became anxious about English activities in this region (1843) an expedition was sent which obtained from the Sultan an acknowledgement of Dutch supremacy. An assistant-resident was installed in 1846, while agreements were made in 1850 and 1863, and later revised in 1902. The Sultan has behaved loyally and has rendered service in connexion with the Achin wars.

The Kongsis

The word *kongsis* signifies 'the administration of common interests'. The Kongsis owe their existence largely to the patriarchal system of the Chinese, by which the head of the family alone possessed and administers the property of the

clan. Before the arrival of the Dutch the Kongsis had become partly commercial in character, as in Sambas in West Borneo, where the gold mines were worked by these societies. The necessity of protection against Dayak chiefs and Malay princes led to the formation of larger Kongsis composed of family units. These sometimes fought similar societies, and one Kongsis often absorbed another.

After the restoration of Dutch rule in 1816 many attempts were made to bring the Kongsis into subjection. In 1850 Pamangkat was attacked, and after some sharp fighting against the Fo-shun, a confederacy comprising the three Kongsis of Montrado, Lumar, and Buduk, the place was subdued. No lasting result was obtained; in 1853 expeditions were sent against the disaffected regions, and in 1854 the Fo-shun confederacy was abolished. Revolts again broke out in Montrado and were only suppressed after some fighting. The conquered districts were made into the assistant-residency of Montrado.

Throughout this crisis the Kongsis La-fong in Mandor, which included the Chinese between the Pontianak River, Lower Landak, the Sepatta, and the Mampawa River, maintained a strict neutrality. It eventually sided with the Dutch and rendered good service by delivering up fugitives from justice. In consequence, the society was allowed to continue under its captain, and its relationship to the Government was defined. In 1884 on the death of the captain the Mandor Chinese were brought under direct control, but not without much rioting and the murder of two officials.

As recently as July 1914 there was some trouble in Mampawa, where members of the Young Chinese party were concerned in a revolt to which, it is said, the rebels expected the Chinese Republic to lend assistance.

CELEBES

The history of Celebes is concerned chiefly with the relations of the Dutch with the Buginese kingdoms round the Gulf of Boni and the Makassarese nation of Gowa in the south-western part of the island. There are other fairly well-organized societies in the north, but their history is bound up with that of Ternate. Of the native Torajas of Middle Celebes, little has been known until recently. Many of their tribes were nominally vassals of the Buginese State of Luwu.

Gowa

Gowa was a State in South-west Celebes with its capital at Makassar. Its friendship for Mataram, the Makassarese Sultan's aggressive policy in the Moluccas, and his protection of English, Portuguese, and other aliens, all provided a good reason for the hostility of the Dutch. In 1600 they gained a victory over Gowa and its Portuguese allies, and in 1667 Speelman, with his Buginese auxiliaries, broke the power of the sultanate. By the Bongay Treaty which was then concluded the pretensions of Gowa to supremacy over the Celebes kingdoms, the Moluccas, and many islands in the Lesser Sunda group had to be abandoned. Certain tracts of the Sultan's territory were surrendered to the Company.

In the eighteenth century the kingdom fell into decay and its integrity was maintained against the people of Boni, who had now in turn become the most prominent State in Celebes, only by the support of the Dutch garrison at Makassar (1739). Similar aid was rendered to a Gowa prince against insurgents in 1776.

Recently Gowa has ceased to be independent. Under the last prince relations with the Dutch became strained owing to the harbouring of criminals in Gowa territory, and the interference on the part of the Gowa Government with the affairs of other States. In 1905 Gowa sent a force to Jampuwa (Sawito) to help the Gowa prince, Krang Allu, against a noble of Sawito. These troops were held up by the Dutch garrison at Makassar, and were only released on the payment of a fine. As a consequence of this act the five chiefs of the Ajatapparang confederation, incited thereto by its head chief, sent back the contracts made with the Netherlands Government. Relations with the Dutch administrative officials were broken off, and the regents of Bonthain and Binanu sided with Gowa against the Government. Troops were dispatched to Gowa and after some fighting the various chiefs of the confederation came in and surrendered. The principal chief lost his life in the fighting. In 1911 Gowa was incorporated in Dutch territory, while the various Gowa enclaves were attached to the nearest Dutch administrative centres.

Boni

The kingdom of Boni originally consisted of a number of small States whose rulers were elected, and together formed

an aristocratic council. This council in turn elected a president of the confederated States, which office became a perquisite of one particular family. At the end of the sixteenth century they were in league with other Buginese States against the Sultan of Makassar, who, however, eventually compelled Boni to submit. In this state of dependence Boni remained until Speelman's victory in 1667, when all the vassals of Makassar were absolved from their allegiance. In 1672 Aru Palacca the pro-Dutch prince of Sopeng was elected as chief of the Boni confederacy, and under him and his successors the kingdom became the most important in Celebes. In their early wars in Java the Dutch relied to a great extent on their Buginese allies, and it was natural that the latter should become arrogant enough to constitute a serious menace to European power in Celebes.

Raffles found them a difficulty and although he inflicted a defeat on their army he made little permanent impression on their attitude towards European government. The Dutch immediately on their restoration were compelled to send an expedition to compel them to subscribe to the Bongay Treaty. Again the European force gained a victory to little purpose, and the troops were compelled to re-embark before their object had been accomplished. It was not until 1848 that all the arrangements were completed for Boni's participation in a revised Bongay Treaty. This acquiescence on the part of Boni proved to be only temporary, and as a result of the provocative behaviour of a Boni princess, who ordered all her ships to carry the Dutch flag reversed, it was necessary in 1859 to send a second expedition. After a short and sharp struggle the capital was taken. By a treaty made in 1860 Boni ceased to be independent, and became a fief of the Netherlands Government, while part of its territory was included within the sphere of direct government. As each prince succeeded to the throne the treaty was either confirmed or modified.

The last prince was La Pawowoni Kraeng Segeri, during whose reign the Dutch had considerable trouble in Boni. Interference in the affairs of other States of South Celebes and refusal to yield up the import and export duties were the chief reasons for a military expedition in July 1905, which after a few days' fighting made an end of the resistance in Boni. The prince himself was eventually taken and banished. He was not

replaced, and the Government devolved upon a council assisted by a European director. The council endeavoured to preserve the old basis of government by treaty, but on the ground that the council was not authorized to contract on behalf of the State, the Dutch declined to accept the old basis, and now regard Boni as conquered territory to be governed as the conquerors deem expedient.

In 1906 considerable disorder was caused by marauding bands, whose operations assumed the dimensions of a rebellion. This was effectually suppressed and its leader banished.

Wajo

This State was a signatory of the Bongay Treaty, but failed to observe its conditions. In 1737 and 1738 Wajorese were in open revolt and a punitive expedition made no impression. It was not until 1888 that the kingdom ceased to be independent, but in that year a treaty was made by which it became Dutch territory. The condition of affairs, till recently at least, was unsettled. In 1899 the Wajorese were at war with Boni, by whom they were defeated and compelled to appeal to the Dutch for protection. In 1902 two factions arose within the State itself. Six chiefs of the federation with help from Boni made war on an illegitimate son of Aru Matowa, the head of the federation. He was defeated. In 1905 the 'short declaration' was applied to Wajo.

Luwu

According to tradition the kingdom of Luwu was the most powerful State of Celebes from the tenth to the fourteenth century. It eventually became subject to Makassar, and when that State was subdued in 1667 Luwu became an independent signatory of the Bongay Treaty. From this time onwards it fell under the influence of Boni. It was not until after the Boni War, in 1861, that the Dutch succeeded in getting a treaty signed. In 1886 there was trouble over the refusal of the Luwu Government to pay a fine for murdering shipwrecked sailors. At the end of the century the state of the country was still unsatisfactory, and apparently it was considered unusual if Dutch ambassadors and explorers were not murdered by the natives. Nominally, however, the State has been governed since 1905 by the 'short declaration'.

Menado

Menado was the site of several colonies formed by Spaniards on the northern coast, where they were followed by natives from the islands of Menado-Tuwa, Talisei, and Bangka. The Sultan of Ternate claimed some degree of sovereignty over these settlements, although the actual power was greater in the Gorontalo and Limboto regions farther to the west. The Dutch first entered into relations with the natives of this region in response to their appeal for help against the Spaniards and the Sultan of Ternate. In 1657 the present capital and a fort were built, and soon afterwards an agreement made for an annual delivery of iron-wood to the Company. In 1677 Sangi and Talauer Islands and later small kingdoms on the north coast were incorporated under the direct rule of the Governor of Ternate. Since that time the influence of the Dutch has gradually expanded; originally Minahasa only was under direct government, but recently all the Gorontalo lands and Sangi Islands were annexed, leaving only a few small kingdoms with self-government. Originally part of the Moluccas, Menado in 1864 was made an independent residency with all its district chiefs in the pay of the Government.

Buton

On the ground of conquest in 1580 Ternate established an early claim to Buton. This was later disputed with success by the Sultan of Gowa. In the seventeenth century, when the Makassarese were waging war against the Company's allies in the Moluccas, the conquest of Buton was first effected to provide a base of operations. It was here that the Makassarese ships were destroyed by Speelman, who by the Bongay Treaty of 1667 compelled the Gowa Sultan to abandon his claims to the kingdom and pay compensation to its chief.

Relations between Buton and the Company, with one break between 1752 and 1766, when the Butonese were suspected of complicity in the seizure of a Dutch ship, continued to be amicable. In 1824 Buton subscribed to the revised Bongay Treaty. About 1850 this was superseded by the system of separate contracts with the different localities, and in 1851 the Sultan of Buton was with difficulty induced to sign one of these. In 1863 the suzerainty of the Sultan of Ternate was abolished.

In 1886 a new Sultan refused to agree to the existing arrangement, and it was necessary to send three warships to bring him to terms. In 1897 and 1901 the same trouble reappeared on the election of a new ruler. The presentation of a new contract in 1906 was therefore backed up by a military demonstration with the desired effect. The trouble, however, was not yet at an end. In 1907 the Sultan and his nobles had to be reprimanded and fined. The registration of the natives roused so much opposition that it was found necessary to suppress disorders by force, and in 1908 further action had to be taken against disaffected persons in the district of Muna. In 1910 a number of chiefs convicted of conspiracy were banished. A Sultan appointed by the Government in the following year seems to be more peaceably disposed towards the Dutch. The kingdom is still self-governed by a Sultan who is elected by a council in which the Dutch administrative officials are gaining an increased influence.

THE MOLUCCAS AND NEW GUINEA

In the middle group of the Moluccas on which the Dutch relied exclusively for their spice cargoes, direct rule was established at an early date, and had its centre in Amboina. Only in Ceram had the Dutch any difficulty in enforcing their authority. The extermination of the clove trees during the Company's period was a source of discontent among the coast peoples, and it was not until the time of Van der Capellen that free cultivation was allowed. During the nineteenth century expeditions have been made from time to time against the peoples of the interior, and the last of these took place as recently as 1910. Since that year there has been no disturbance, and in 1914 the garrison which had been kept at Wahai since 1880 was found to be no longer necessary.

In the northern group the three sultans of Ternate, Tidore, and Bachian still make some pretence at self-government, but without any real power. The Sultan of Ternate is regarded as the chief vassal by the Dutch, and his position keeps alive the old-standing jealousy of Tidore and Bachian. All three have recently subscribed to the 'short declaration'.

By a treaty dated 1660 between the Dutch and the three States of Ternate, Tidore, and Bachian the Company was acknowledged to be 'lord of the Papuans or all their islands

which are subject to the King of Tidore'. In this way the Dutch obtained a nominal sovereignty over the Tidorese fiefs on the islands of Waigiu, Salwatti, and Misol. On the island last named were two kingdoms, Waigama and Misol, possessing vague sovereignty over parts of the mainland of New Guinea, on the north-west coast and the south-west coast; the suzerainty of Tidore was also acknowledged in the neighbourhood of McCluer Gulf. The first establishment of the Dutch was not set up until 1828, when Fort du Bus was built, and the extent of Dutch sovereignty was then defined, as it was later, in 1848. In 1898 the territory of Tidorese vassals was assigned to Ternate, and in 1911 West New Guinea became part of the residency of Amboina. In 1909 the chiefs subscribed to the 'short declaration'.

LESSER SUNDA ISLANDS

Bali

Hindu influence on Bali was in all probability introduced direct from India, but little is known of the history of the island until it became an independent political unit under refugee princes from Majapahit (about 1480). But towards the end of the seventeenth century the provinces into which the Balian empire was divided assumed an independent status under their respective governors, and in this way nine separate principalities came into being. They were Klungkung (the original suzerain State), Karang Asem, Mengwi, Badung, Bangli, Tabanan, Gianjar, Buleleng, and Jembrana. Little trade was done by the Dutch with Bali until a post was established in Badung for contracting for slaves. Many of these were sent to Batavia and compelled to join the Dutch army. An official statement of 1778 gives the number of Balias sent to Batavia as 13,000.

Towards the end of the eighteenth century the English began to take an interest in Bali, and the Dutch took the precaution of establishing military posts commanding the Bali Strait from the Java side. It was through the agency of the Bali rajahs that Raffles was enabled to enter into communication with the native princes of Java. Raffles later became unpopular with the rajahs because of his prohibition of the slave trade, and in 1814 it was necessary to make a military demonstration in

..... Buleleng, whose prince had endeavoured to re-establish his claim to Balambangan.

Soon after the restoration of Dutch power, Commissioner H. A. Van der Broeck was sent to Bali to renew old relations, but he found that Dutch prestige had suffered considerably. From 1826 to 1831 a Dutch official resided in Badung for the purpose of enlisting recruits for the Dutch army, then hard pressed in Java. The fear of English influence in 1839 impelled the Dutch to obtain from the Bali princes a recognition of their supremacy, which was, however, to give no rights of interference in the internal affairs of the Balinese. It was also agreed that the rajahs should forego their ancient right of confiscating the cargoes of ships wrecked on their coasts.

In 1844 the *tawan-karang*, or 'shore right', was applied by the Rajah of Buleleng to a ship flying the Dutch flag. He was disposed to grant the compensation demanded by the Dutch, but his anti-Dutch prime minister induced him to refuse, and to back his refusal by force of arms. His example was followed by the neighbouring State of Karang Asem, and in 1846 it was necessary to send an expedition which, after the capture of Singaraja, brought the two princes to terms. They both agreed to recognize Dutch suzerainty and to render homage at Batavia every three years, besides paying the expenses of the war and receiving a Dutch representative in their territories.

The influence of the anti-Dutch prime minister of Buleleng was still paramount, and he not merely prevented the two rajahs of Buleleng and Karang Asem from fulfilling their promises, but inveigled the Dewa-Agong of Klungkung into his conspiracy against the Dutch Government. Several ships wrecked on the shores of Bali were looted, so in 1848 it was decided to send a further punitive expedition. This was directed against Buleleng only, and was a failure. Except for a fort on the coast the island was temporarily abandoned. In 1849 an expedition on a larger scale than before was prepared. Buleleng was first attacked and the rajah with his prime minister were driven to Karang Asem. In the operations against this latter place assistance was promised by the pro-Dutch prince of Bangli and the prince of Lombok, who had pretensions to territories in Karang Asem. The rebel rajah committed suicide and the Dutch troops crossed into Klungkung, where soon the Dutch

commander received the homage of Klungkung, Badung,
Tabanan, and Gianjar.

In place of the fugitive rajah of Buleleng the prince of Bangli was installed by the Dutch, and Karang Asem became a fief of the Lombok rajah of Mataram. The nominal supremacy of the Dewagong of Klungkung was abolished. All the Bali princes signed a new treaty recognizing Dutch supremacy, prohibiting European settlements, piracy, slavery, and the exercise of 'shore right'. The Dutch still professed that they had no intention of interfering in Balinese internal affairs.

Dutch influence made most headway in the two principalities nearest Java, Buleleng and Jembrana. In 1854 the prince of Bangli had been so unsuccessful as ruler of Buleleng that he abdicated, and in his place the Dutch installed a native regent with the title of rajah, to be assisted by a controleur under the assistant-resident of Banyuwangi. In 1856 a similar arrangement was made in Jembrana, whose prince had abdicated. With the assistance of a Buleleng chief from Banjar the ex-prince of Jembrana attempted in 1857 to regain his former power, but the attempt was quelled, and he himself was banished. In the following year his accomplice, Njoman Gempel of Banjar, made a similar attempt and was dealt with in the same way. A controleur was left to supervise the government of the native regent in Jembrana, but in 1861 an assistant-resident made his head-quarters at Buleleng. The Dutch Government in these two provinces assumed the right of calling up the inhabitants for military service. It also exercised certain powers in the realm of justice, abolished torture, and prohibited widow-burning.

The possession of these rights did not prevent a good deal of extortion and tyranny on the part of the native regents, and in 1866, in response to native complaints, the regent of Jembrana, was banished. In 1874 the regent of Buleleng was similarly dealt with. The district of Banjar in particular was troublesome. A banished chief returned thither in 1864 and by 1868 rebels under his leadership were threatening Singaraja. A Dutch expedition drove the rebels from this place, but suffered a reverse at Banjar. On the arrival of reinforcements the country was subdued and the rebel chiefs punished. After the banishment of the regents of the two countries a temporary expedient was adopted. The Government now consisted of a committee of notables under the presidency of a European

official, and this state of affairs lasted until 1882, when the two provinces were brought under the direct Dutch rule of the Residency of Bali and Lombok.

The ranks of *raja* and *patih* (prime minister) were now abolished, and the district chiefs became officials appointed and salaried by the Dutch Government. Singaraja in Buleleng became the head-quarters of the Provincial Government with two controleurs, and in Jembrana there was a controleur at Negara. Political disturbances of a serious kind now ceased.

Meanwhile, the other States of Bali were engaged in constant civil war which the arbitration of the Dutch could do little to prevent. The small State of Mengwi was subject to the attacks of its neighbours, and in 1891 it ceased to be independent and was divided among Badung, Tabanan, Klungkung, and Gianjar. The last State itself had a chequered career. In 1883 it was induced through fear of Bangli to become incorporated in Klungkung. However, as a consequence of a successful revolt, it regained its independence in 1893, but the menace of its neighbours, Bangli, Klungkung, and Badung, impelled it to seek Dutch protection in 1900.

Karang Asem in 1894 had not supported its overlord, the *raja* of Mataram in Lombok, in his war against the Dutch, and, as a reward, in 1895 the regent was given the title of Stadtholder by the Batavian Government. The Dutch rule in Gianjar and Karang Asem ensured immunity from the attacks of their neighbours.

More difficulty was experienced with the other *rajahs*. It was necessary to make a naval demonstration to induce the Dewa-agong of Klungkung to give up some criminals whom he harboured. Generally, the *rajahs* placed every obstacle in the way of attempts by Dutch officials to improve the native administration. It was not until 1903 that the custom of widow-burning could be completely suppressed.

In 1904 a schooner from Banjermasin was wrecked on the Badung coast, and its cargo was looted. The two *rajahs* of Badung refused compensation, and defied the Dutch Government. The *rajahs* of Tabanan and Bangli openly sided with Badung, and the forces of Bangli made raids into Karang Asem and Gianjar, both Government territories. In 1906 an expedition was dispatched to Badung and in the hostilities which ensued the *rajahs* were slain. The *raja* of Tabanan submitted,

but on hearing of the Government's intention to deport him he and his son committed suicide. Klungkung was forced to give up its enclaves in Gianjar, and ten *desas* taken from that territory by Bangli had to be restored. All firearms were given up. South Bali was placed under European control with an assistant-resident at Den Pasar and controleurs at Tabanan and Gianjar, the last also supervising Bangli and Klungkung. Karang Asem was the head-quarters of an assistant-resident.

Except for a rebellion in Tabanan in 1906, Badung, Tabanan, and Gianjar have remained quiet. In 1908, shortly after the introduction of opium regulations, a local insurrection in Klungkung involved the Dewa-agong, and it was found necessary to reduce him by force. The Dewa-agong and his family deliberately sacrificed their lives in a hopeless attack. The remaining chiefs of high caste were interned in Lombok.

In Karang Asem the nephews of the loyal Stadtholder were stirring up trouble, and a Dutch force was sent to compel their surrender. In Bangli the Government was revised, the rajah being made a Dutch official with the title of Stadtholder, and the oath was administered to the chiefs in both Bangli and Karang Asem. In 1911 Klungkung was formally brought under direct rule and in 1912 the successors of the Standtholder in Bangli and Gianjar were made regents. In 1914 military garrisons were removed and their place was taken by an armed police corps.

Lombok

An early reference to Lombok (1640) indicates that the Sultan of Makassar regarded the island as part of his dominions. When the power of the Sultan was reduced by the Dutch in 1667-8, a Sumbawa chief seized the opportunity to impose his sovereignty on the people of Lombok. At this time (1674) the Company concluded a contract with the Lombok regents, who promised to remain loyal to the prince of Sumbawa. It was not long, however, before disorders broke out in Sumbawa itself and the States of that island were soon involved in civil war. The country became a prey to pirate adventurers from Makassar, who since the downfall of their political power had roved about the archipelago plundering and destroying even in Java itself.

Another power which profited from this state of anarchy was Bali. Balinese inhabitants of Lombok, assisted probably by

their fellow-countrymen from across the Strait, destroyed the important village of Salamparang (1692), and soon became a menace to Sumbawa. These events threatened to upset the arrangement established by the Bongay Contract, and the Company endeavoured unsuccessfully to get the signatories to take action against the Balinese. The latter succeeded in establishing four kingdoms on Lombok: Mataram, Karang Asem, Pagasangen, and Pagutan. Although a nominal homage to Karang Asem in Bali was acknowledged, the four kingdoms were practically independent and were constantly engaged in wars for supremacy. The struggle terminated in a sanguinary conflict in 1838 when Mataram emerged indubitable victors.

In 1843, in a contract entered into by the Company and Mataram, the latter acknowledged the suzerainty of Karang Asem in Bali. However, in 1849, when the Company was at war with the Balinese States of Klungkung and Karang Asem, assistance was given by the prince of Mataram against his overlord, and as a reward he received Karang Asem in Bali as a fief. This turn of fortune increased the presumption of the prince of Mataram, who regarded the treaty of 1843 as one of alliance with the Dutch and not as a recognition of their suzerainty.

Friendly relations with Mataram continued until 1872, when the vassal prince of Mataram in Karang Asem ceased to send the regular embassy to Batavia. The same kingdom in 1891 interfered in the domestic politics of Bali, and Sasak troops were sent from the suzerain State in Lombok.

Apart from the arrogant bearing of the prince of Mataram towards his overlords at Batavia, his internal administration, in which the Dutch had in 1843 promised not to interfere, began to give cause for anxiety. Generally speaking, society in Lombok consisted of a Hindu governing class, the Balinese, and a Mohammedan subject population, the Sasaks. From the beginning of Balinese domination, the Sasaks had been cruelly oppressed, and from time to time they made ineffectual attempts to throw off the Balinese yoke. Finally, they implored Dutch aid, and in 1894, very reluctantly, the Dutch sent an expedition which overthrew the native government. Lombok was now made a division of the Residency of Bali and Lombok, under an assistant-resident at Ampenan, and was divided into two districts, East and West Lombok. In 1898

a third district was made in central Lombok in order to allow of a stricter supervision of the Sasak district of Praja. The capitals of the three districts were at Mataram, Praja, and Sisi. Karang Asem in Bali has now no connexion with Lombok. The native administration was organized under twelve district chiefs, with thirty-seven *pengawas* over the Balinese population. The Balinese proved docile enough; the main difficulty was experienced in dealing with the Sasaks. As a consequence of the recent Sasak revolt against their Balinese oppressors, the latter had annexed Sasak lands on which the original proprietors were compelled to give their services. After the victory of the Dutch no immediate settlement of this grievance was made, and many cultivators refused to yield up the proportion of the harvest due to their new landlords. Sasaks who considered themselves wronged united in causing disturbances, and as lately as 1897 robber bands were still at large. With a view to remedying this state of affairs it was decided in 1897 to undertake a survey of West Lombok. As recently as August 1914 there was a small disturbance in Middle Lombok, where the rumour that the Japanese had conquered Holland, and that a Japanese warship was then lying off the east coast of the island, caused a revolt which was suppressed without difficulty.

Sumbawa

The history of Sumbawa has from early times been bound up with Gowa or Makassar in Celebes, and until recently the island with a dependency in West Flores was included in the administrative division of the Government of Celebes. The original States of Sumbawa Island were Bima, Dampo, Sanggar, Tambora, Papikat, and Sumbawa. Since the rebellion in Tambora in 1815 that State and Papikat have ceased to exist.

Sumbawa State.—Of the early history of Sumbawa little is known except that it was once a dependency of Majapahit. Subsequently, in 1616 it was claimed as a vassal State of Gowa in Celebes. Having first refused to sign the Bongay Contract it was later compelled to do so. Among the chiefs present at the signing of the treaty was one from Saparang or Salamparang, now known as Lombok. This fact affords further evidence that Lombok was for a short period subject to the Rajah of Sumbawa. By 1740 the Balinese had completely broken the power of the Sumbawa ruler in Lombok.

Sumbawa was also involved in the civil wars between the other states of the island and in 1701 under the auspices of Dutch arbitration a treaty was arranged, by which all the kingdoms except Papikat were to be regarded as of equal status. In 1765 the Company concluded a separate agreement with Sumbawa, which remained in force until 1858. By this treaty the Sultan engaged to deliver a certain quantity of sapan wood at a fixed price. Owing to the low selling price of the wood it was found necessary in 1875 to revise the original contracts. It was again revised in May 1905 in a treaty on the Celebes (1904) model, by which it enjoys a measure of self-government.

Bima.—The Dutch entered into relations with Bima as early as 1605 and subsequently the Bimese assisted the Sultan of Makassar against the Company. From the Bongay Treaty it can be inferred that the Sultan had previously preferred claims to Bima which he was now called upon to renounce. Two years later commercial restrictions were imposed on the natives and an end made to the Makassarese influence. A spasmodic recrudescence of Makassarese power occurred in 1759 in Manggarai in West Flores, a dependency of Bima, but this was soon suppressed. A contract made in 1857 was revised in 1886 on the same plan as that of Sumbawa (1875). It recognized the supremacy of the Netherlands and arranged the succession to the throne. A controleur was placed at the capital to supervise the carrying out of the treaty and to advise in state affairs. In 1905 the contract, which still allows of self-government, was further revised on the Celebes (1904) model.

Sanggar.—Originally subject to the Sultan of Ternate, Sanggar became a subject state of the Sultan of Makassar. When the Bongay Contract of 1667 was concluded it became a fief of the Company. In 1858 a new treaty was made with the prince and his nobles, and in 1905 Sanggar's right of self-government was defined in a new contract on the Celebes (1904) model.

Dompo.—The Bongay Contract dissolved the allegiance of Dompo to Makassar, and since that time it has been a party to the Treaty of 1765, which fixed its status, and subsequent treaties with the Dutch in 1858, 1886, and 1905.

Flores and Solor

From early treaties it appears that Flores was originally tributary to princes of Celebes, including Makassar, while chiefs

of the Solor group agreed, in 1618, to recognize the suzerainty of the Sultan of Ternate. In 1667 when the power of the Celebes princes was broken the Makassarese and their neighbours were excluded from trade with the Flores region, and in 1683 the Sultan of Ternate was deprived of his dependencies in Solor, which now became Dutch territory. In the background was ever a shadowy claim of the Portuguese, which they asserted from time to time. They claimed in particular the Solor Islands and Larantuka in East Flores, but nothing to the west of that place. In 1757 there was some apprehension lest Larantuka should be ceded to the French by the Portuguese, and a Dutch agent was sent to Solor to acquire that island for the Company. In 1818, when differences arose between Holland and Portugal as to their respective possessions in Timor, a conference of commissioners drew up a list in which Larantuka, among other places, was given to Portugal.

The Dutch appear to have stationed an agent at Endeh Bay soon after the destruction of the power of the Celebes princes. In 1818 a Dutch official took up his residence at Endeh Bay with the object of suppressing piracy. No impression was made until 1838, when the place was bombarded and seven chiefs journeyed to Kupang to apologize for their piratical activities. A treaty was then made to which other Endeh chiefs also agreed.

Dutch reprisals in Larantuka involved them in difficulties with Portugal, which came to a head in 1848 when a Dutch agent was sent to Lawajong in Solor to recruit labour. In view of the reiteration of Portuguese claims to Flores and Solor a treaty was concluded by which Larantuka, Sika, and Paga in Flores, and the islands of Solor and Adunara, were given up to the Dutch. Although the treaty was not ratified until 1859 Dutch garrisons entered into occupation at Larantuka and Lawajong in 1851. The senior military officer became civil governor of the new division of the Solor Islands.

Later a civil official was appointed at Larantuka, but the removal of the garrison considerably diminished his opportunities of making Dutch influence felt in native politics. The eastern end of Flores was the scene of constant feuds between the coast chiefs and the inland population, besides slave-raiding and piracy. Owing to ignorance of the native conditions Dutch interference on the rare occasions on which it was exercised was

not always attended by fortunate results. In a readjustment of territory in 1865 Sika was included in Larantuka, and this was a source of endless trouble. Otherwise, the officials did little but exhort or threaten the native rajahs, from whom they received promises, seldom kept. On the rare occasion of a military demonstration the natives were accustomed to retreat into the interior, and the only satisfaction exacted was the burning of empty *kampongs*.

In 1864 an official was stationed at Endeh to keep a watch on the slave trade which was carried on between Endeh and Sumba. In 1871 the Sumba administration became responsible for Endeh and furnished their representative there with a vessel, which proved inadequate for the suppression of the slave trade.

In Larantuka the increase in steamship traffic had much to do with the disappearance of slave-trading, and by 1890 there were few convictions. The Rajah of Larantuka was the source of much trouble with which the Dutch were powerless to deal. The boundary settlement of 1865 gave this potentate control of the people of Sika on the south coast, and they suffered considerably in consequence. When in 1879 the administrative division comprising East Flores and the Solor Islands was created officials were stationed at Maumere and Trong. The appointment of the Maumere agent brought about an immediate improvement in the condition of the Sika population.

The Rajah was guilty of aggression in other directions, and as lately as 1902 he made a raid by sea on the north coast of Flores. He was also constantly at variance with the Rajah of Adunara, chiefly owing to the fact that each claimed territories beyond the dominions of the other. His zeal for Christianity led to a rebellion among his heathen subjects, and the Dutch found it necessary to interfere. But, generally, the Dutch Government was able to make little impression on the situation.

The condition of affairs in Solor Island was equally unsatisfactory. The post at Lawagong was abandoned in favour of Trong, but in 1889 local disturbances compelled the Dutch official to beat a hasty retreat to Larantuka. Thereafter, it was decided that the agent should not interfere, but content himself with giving advice. In 1898 he withdrew to Larantuka.

In central Flores the Dutch, in 1874, concluded a treaty with one of the principal chiefs, and were thereby encouraged to investigate the tin region rumoured to be situated in the centre

of the island. In 1887, 1888, and 1889 attempts were made to penetrate into the interior, but they all failed as a consequence, it was said, of the influence exercised in that region by the Celebes rajahs. In 1890 two large military expeditions were compelled to withdraw owing to the hostility of the natives.

The arrival of the Resident Heckler at Larantuka in 1902 marked the beginning of a new policy. The Rajah of Larantuka had set aside an agreement made in 1898 by which the Dutch secured the right to collect taxes. He further removed from the Government all rajahs with whom he disagreed, and broke off relations with the Dutch representative. Heckler restored the old state of affairs, but the continued arrogance of the rajah necessitated in 1905 his arrest and banishment. In 1912 his son succeeded to the sovereignty.

Armed intervention in Solor was found to be necessary, and in 1909 the subdivision consisting of the islands of Adunara, Solor, and Lomblen was included in the province of the Civil Governor of East Flores. In 1914 Adunara and Lomblen were made into an independent subdivision under an official at Wae Werang, with an assistant at Wae Komu, while the island of Solor was added to the subdivision of East Flores and Solor, under a Civil Governor at Larantuka. In these regions the Dutch administration has now established its control.

With Ende as a base the Dutch began to explore the interior of Flores. After a few set-backs a body of mounted police explored the whole of the inland region in 1907, and seems to have terrorized the inhabitants. Civil government was eventually established, and a controleur was put in charge of the whole Flores division, inclusive of Solor. In 1910 South Flores became a separate subdivision.

The Manggarai district of Flores, originally subject to the Sultan of Bima in Sumbawa, was included in the province of Timor, along with the remainder of the sultanate. Of Manggarai little is known, and the Dutch have only interfered to suppress one rising, which occurred in 1909. In 1915 it was made into two divisions with administrative officials at Reo and Ruteng, and its government is associated with that of the sultanate of Bima. Taxation and compulsory service continue to be causes of disorder in Flores, and the inhabitants are slow in adapting themselves to the new conditions. Except for Manggarai in the west, which is treated as part of the sultanate of Bima, the

States of Flores are subject to the terms of the 'short declaration' under which they are allowed some measure of self-government.

Timor

The first Dutch landing on Timor was effected in 1613 after a Portuguese garrison had been driven from a fort on Solor. Permission was obtained from the Rajah of Kupang to found a settlement in his capital. Of this privilege the Dutch availed themselves only for three years, but after a temporary absence they returned again in 1619, and have remained ever since.

Their chief enemies were the 'black' Portuguese of Ocussi. These are said to be the descendants of the followers of a Portuguese who married the daughter of the local rajah. With them were often allied the people of Ambenu and Amarassi. In 1749 these allies, along with the 'white' Portuguese from Lifau, on the north side of the island, invested Kupang in overwhelming force (1749), but the garrison was unexpectedly relieved, and the Portuguese almost annihilated. About twenty years later the Portuguese fell out with their allies of Ocussi, and in consequence transferred their capital to Dili in the eastern half of the island.

The Dutch supremacy in the western half was now unquestioned, and in 1756 a treaty was made with fifteen native chiefs, which provided a basis for the exercise of the Company's rights in that region. After this, the interest of the Dutch in Timor seems to have flagged, and outrages by the 'black' Portuguese of Ocussi went unpunished. In 1797 the Company's representative successfully resisted an attempt on the part of the English to take possession of the island in the name of the Prince of Orange. A further attempt in 1810 almost succeeded, but again the English were compelled to withdraw. After the capitulation of Java the Dutch flag on Timor was eventually hauled down.

During the British rule in the archipelago, the Portuguese availed themselves of the opportunity of seizing a Dutch district, Atapupu, but the Dutch resident appointed after the Dutch restoration soon drove them out. This led to interminable disputes and several frontier 'incidents'. It was not until 1859 that the first serious attempts at a settlement bore fruit in the treaty of that date. (For the history of these negotiations and

those which ensued, see the section on Diplomatic History, p. 529.)

Meanwhile Dutch administration on Timor was extended along the coasts, but practically no progress was made in the interior. Private attempts to start tea and sugar plantations came to nothing. In 1898 and 1899 the consent of the local rajah was obtained for the beginning of mining operations.

The relations of the States of Timor with the Dutch Government are governed by a special kind of treaty known as the 'Timor Declaration', which is a combination of the concise 'short declaration' providing for the acknowledgement of Dutch supremacy and obedience to Dutch commands, and the detailed contract of the old kind. This arrangement permits of a measure of native self-government.

Sumba

Sumba was early noted for its export of sandalwood, and from a register of 1663 it can be gathered that the island was a tributary State of the kingdom of Bima. In 1756 treaties were concluded with the chiefs of Sumba, who may by this time have become independent. Nominally, these treaties remained in force until 1845. In 1758 the island was explored and a report drawn up as to its economic possibilities. Sandalwood and slaves were said to be the chief commodities available, but the prospect of expensive military operations necessary for the subjection of the island discouraged the Company from following up its investigations. There are traces of a Dutch agency as late as 1775, but in this year it was apparently withdrawn. The contract of 1756 became a dead letter; it was found difficult to procure sandalwood from the natives, and impossible to obtain an acknowledgement of their allegiance to the Company.

It was not until 1836 that the Batavian authorities through the agency of the Resident of Timor were made acquainted with conditions on Sumba. The island was said to be divided into thirty-three petty kingdoms, and in one of these, Manjili, there was an official who, it appeared, had been appointed at the beginning of the century by the Dutch agent at Timor to represent the Government. In 1855 a new treaty was made with some of the chiefs, but it soon fell into disuse. In 1860 it was replaced by another.

This last treaty was signed by the Rajahs of Taimanu,

Kadumbu, and Manjili; during the following years other rajahs, including the chief of Lewa in 1874, gave their assent. In this year, however, an attempt was made on the part of two chiefs to drive out the controleurs who had been stationed since 1866 at Kabanisu. Owing to the hostile attitude of the natives they had to be withdrawn. Since 1879 the administrative staff has consisted of a controleur and two subordinate agents whose chief duty is to buy horses for the Government.

Sumba was the scene of constant disturbances, with which the Dutch found it difficult to deal. One of the chief instigators of disorder was an Arab, Abdul Rahman, who had been banished from Pontianak, and had gained great influence at the capital, Waingapu. His intrigues were not discovered until 1876, when he was banished from the island, and he died a year later in Timor. In 1876 Dutch intervention was also necessary to punish the people of the kingdom of Batu Kapedu, who were guilty of piracies and other offences. Auxiliary troops from Savu were used to effect their subjection, and their chief eventually gave himself up. The Rajah of Lewa gave the most trouble. Assisted by bands of Endehnese from Flores this chief roved through the island on man-hunting expeditions. Apart from attempts to stop the immigration of Endehnese, the Dutch were powerless to prevent the slave raids, and tranquil conditions were not restored until the death of the rajah in 1892, and then the respite proved only temporary. A report of 1900 refers to the persistence of feuds between the various States of the island, and in 1901 the Rajahs of Lewa and Rendeh conspired to attack and destroy the capital, Waingapu. Dutch troops were landed, and assisted by Endehnese auxiliaries they destroyed the head-quarters of the Rajah of Lewa, who was compelled to take refuge in the interior. Attempts to ameliorate the condition of affairs by means of Christian missions are said to have made little impression. At present, while many of the tribes are subject to the terms of the 'short declaration', about fourteen are bound by no treaty obligations of any kind. In one of these latter districts, Lamboja, the natives in October 1914 came into conflict with the Dutch military forces.

DIPLOMATIC HISTORY

The foreign relations of the Dutch East Indies involve practically only three other European nations, chiefly Great

Britain and Portugal, and in a lesser degree, Germany. Relations with native governments are more a matter of internal administration than of foreign policy.

Great Britain (Treaty of 1824, &c.)

The relationship between the Dutch and English in the East goes back, as has been seen, to the beginning of the seventeenth century, but it is sufficient to consider it from 1824 when an attempt was made to settle the difference outstanding the settlement at the end of the Napoleonic period. The conquest of Java had encouraged many Englishmen to hope for a revival of British commercial influence in the archipelago, and it was in the light of this desire that the two nations entered into the treaty of 1824. The main question at issue was, as it had been previously, economic, but as this almost always involved political considerations to which greater importance was subsequently attached, it will be convenient to consider the treaty from the two points of view—economic and political.

Economic Considerations.—Down to the end of the eighteenth century the Dutch had avowedly aimed at a monopoly of the trade of the Dutch East Indies, but now, having received back their possessions as a gift from the allies, in particular Great Britain, they could not hope to proclaim the continuance of the monopoly in face of Great Britain's desire to be admitted to the trade of this region. So the first four articles of the treaty of 1824 contain the principle and details of a policy of reciprocal advantage granted by one Power to the other in their respective possessions in the East. Each was to be admitted to the ports of the other on the footing of the most-favoured nation. So much is stated in the first article. The meaning of 'most-favoured nation' is made clear in the second article, where it was arranged that the traders and ships of one nation, when exporting or importing at the ports of the other, should not pay more than double the duty charged to the traders and ships of the nation to whom the port belonged; and further, where no duty was charged to the latter the duty charged to the traders or ships of the other should not exceed 6 per cent. An exception to this arrangement was made in favour of the Dutch spice monopoly. The third article stipulated that treaties with independent native governments of the Eastern seas should not be made by one of the nations with a view to excluding the

trade of the other, and that treaties made with native governments before 1824, and those that might be made in the future, were to be communicated by the Power so contracting to the other. By the fourth article orders were to be given to local authorities not to interfere with this freedom of trade, nor yet with the free communication between the ports of either nation and the ports of the native governments.

It can be seen that these commercial arrangements were of great value to British merchants. Singapore was very favourably situated as a *dépôt* for the large volume of trade carried on by natives in small craft throughout the archipelago. Especially was it suitable for the collection of pepper, of which large quantities were exported from Sumatra. Again the British industries, particularly cotton manufactures, were well ahead of those in other European countries, and their products could be placed in the Eastern markets at a cost upon which even considerable duty could have little effect. The merchants of Singapore and Penang had also by this time secured some very favourable trading privileges from various independent native States, particularly in Sumatra.

From the outset the Dutch aimed at acquiring for the infant industry of the mother-country the monopoly of trade which by the terms of the treaty was declared illegal. In respect of cotton and woollen manufactures this was especially evident, for just previous to the signing of the treaty these articles of foreign manufacture were made subject to a duty of 25 per cent. in the case of goods coming from the westward of the Cape of Good Hope, and 35 per cent. when exported from ports to the eastward of that point, i. e. from such ports as Singapore and Penang, the local distributing centres of British manufactures for the markets of the archipelago. These regulations were in direct contravention of the treaty and they elicited protests from merchants both at home and in the Straits Settlements.

In 1826 there was some show of modifying the objectionable regulations in accordance with the treaty, but in 1830 we find further complaints against the same duties and renewed remonstrances by the British Government. In 1831 a decree was issued in Netherlands India purporting to modify the duties, but its effect was merely to substitute a new preference in favour of Dutch shipping. The decree was shortly afterwards withdrawn, and although the Dutch Foreign Minister asserted

that Dutch and British goods were at this time imported on the same footing, both being subject to 25 per cent. duty, in practice the duty was paid only by the British. Apparently, while the Dutch Government at the Hague imagined the treaty was being complied with, the Batavian authorities maintained the old state of affairs. In 1835 the Duke of Wellington took up the matter, and at this stage the Dutch attitude was that although they were contravening the letter of the treaty, yet inasmuch as statistics showed the British to possess a fair share of the trade, the Dutch policy was in accord with its spirit. There were also quibbles as to the interpretation of the letter and it was even argued that the article relating to 'ships and subjects' referred to anchorage dues and a poll tax. Later in the same year a strongly worded dispatch from Palmerston succeeded in exacting a promise, reluctantly given by the Dutch Government, that Dutch goods should in future bear a duty of $12\frac{1}{2}$ per cent. This concession was made not as due to the terms of the treaty but in the interests of the amicable relationship between the two countries.

In June 1836 the new arrangement came into operation. Even yet, goods which came from the eastward of the Cape of Good Hope were still subject to the old tariff, and although this disability theoretically affected the goods of all nations, including Holland, in practice it bore mainly on the British, and was directed against the trade of Penang and Singapore. Moreover, the benefit of the new arrangement had to a great extent been nullified by the increase of the duty in June 1834 to 70 per cent., and in November of the same year by the regulation which limited the access of foreign trade in cottons and woollens to the Dutch Indian possessions, to the three ports of Batavia, Semarang, and Surabaya. By this means British trade to the Outer Possessions of Netherlands India was subjected to a possible prohibition and inevitably to expense and great inconvenience. Accordingly, Lord Palmerston again took up the tale of remonstrance, but not without first pointing out to complaining British merchants that while their own trade in Netherlands India was steadily increasing that of the Dutch exhibited a steady decrease; he also took the precaution of making sure that the East India Company in Bengal on its side was carrying out the letter and the spirit of the treaty of 1824. The reply of the Hague Government explained the two

objectionable regulations as having been directed against the trade of Belgium, with whom Holland was then at war. It was further stated that both had been revoked in October 1839.

In 1837 what was described as the fundamental principle of the tariff policy of Netherlands India was embodied in an arrangement by which Netherlands products were protected by a tariff of 12 and 12½ per cent., as against 24 and 25 per cent. imposed on foreign products. Although the high duty constituted a serious disability to British trade it was in strict accordance with the treaty.

Political Questions.—Throughout the correspondence of this time there were references to Dutch encroachment on certain native States in Sumatra, and to the apprehension felt by British merchants at the prospect of a change in the political status of governments with whom the British Government had entered into commercial treaties, which accorded to British trade conditions far more favourable than those to which it was entitled under the treaty of 1824. This involved a consideration of these articles of the 1824 treaty which were of a political character.

Articles 8, 9, 10, 11, and 12 of the treaty stipulated for the following territorial adjustments. The Dutch gave up their ports in British India, while the British abandoned Sumatra and renounced any intention of making further settlements there, or even concluding treaties with native governments therein. The Dutch ceded Malacca and renounced intentions of settlement on the Malay Peninsula or concluding treaties with native governments therein. The Dutch were confirmed in the possession of Billiton and the British in that of Singapore, while the latter engaged to make no settlement on the islands south of Singapore. With these articles must also be borne in mind the convention of 1814, which reinstated the Dutch in their East Indian Possessions of 1803 and exchanged Cochin in India for Banka, acquired by the British during their government of Sumatra. In the notes exchanged by the plenipotentiaries, and appended to the treaty of 1824, it was agreed that the independence of the State of Achin in Sumatra should be respected by the Dutch (see p. 489).

The problem which was destined to arise out of the treaty was whether it could be considered to delimit (as asserted by the

Dutch) the spheres of political influence of both Powers in the particular sense that, whereas the British were to be restricted to the mainland, the Dutch were to develop freely in the archipelago, or as merely setting down the political situation as it existed in 1824 and in no way indicating lines of future development, with the exception of those negative instances expressly specified in the treaty. This latter view was subsequently adopted by the British Government. This problem assumed concrete shape when the question of Borneo came up for consideration. However, the special circumstances which surrounded the politics of Sumatra may well be considered first.

Sumatra.—The British had engaged to abandon Sumatra permanently. But they still maintained a very profitable commercial connexion with certain native States which they chose to regard as independent, and which, in virtue of their independence, had during the régime of Raffles granted valuable trading privileges, such as exemption from import and export duties, to British merchants. So the commercial communities of Singapore and Penang viewed with alarm the gradual extension of Dutch political power among the native States, first Palembang in 1823, then Jambi in 1834, in 1840 the dependencies of Siak Sri Indrapura, and in 1858 even the last-named State itself. From this latter State in 1818 Britain had secured by treaty the right of importing on the footing of most-favoured nation, and such an arrangement was likely to expire in event of Siak becoming subject to the Dutch, who would be sure to impose the comparatively disadvantageous arrangement under the terms of the treaty of 1824.

Lord Palmerston therefore endeavoured to preserve the independence of Siak or at any rate the privileges granted to British merchants, and argued ingeniously that the Dutch action was an infringement of the article which forbade either Power imposing on a native State an arrangement which ended to the disadvantage of the trade of the other. Such an arrangement, he pointed out, had already been made with Jambi, whose export and import dues were already in Dutch hands. It was not until 1871 that the matter was finally settled by the 'Sumatra Treaty', wherein Britain acknowledged Dutch sovereignty on Sumatra but obtained admission to the native trade on the same terms as the Dutch.

This treaty withdrew British protection of a shadowy kind

from the kingdom of Achin. The note of the British plenipotentiaries appended to the treaty of 1824 contained an expression of their solicitude for the continued independence of Achin, to which, in a second appendix, the Dutch plenipotentiaries accorded a vague assent. This reservation disappeared in 1871, but in spite of this, the Achinese endeavoured unsuccessfully in 1873 to involve Britain in their quarrel with the Netherlands Government. An Achinese vassal was more successful in 1883, when, in order to enlist British sympathies against a Dutch blockade, the Rajah of Tenom kidnapped a British crew of the steamer *Nisero*, whom he offered to release only on condition that his ports were reopened to trade. He attained his object when, through British importunities, the Dutch, in return for the sovereignty of Tenom, paid the rajah an indemnity and withdrew the blockading ships.

Borneo.—Although it was perhaps natural that the Dutch should adopt the view that the treaty of 1824 indicated the lines of future political development for Holland in the archipelago and Britain on the mainland, a close study of the treaty reveals the fact that the possibility of future British settlements in the archipelago was implied therein. The sixth article, for instance, engages that settlements in the Eastern seas shall not be made by agents without the previous authority of their respective Governments in Europe, thereby implying that settlements could be made by both Powers.

The particular clause of the treaty of 1824 on which the Dutch based their position was that in which the British agreed to refrain from settling on islands to the south of Singapore. But this stipulation could not be held to apply to such islands as Celebes and Borneo. This was the view which was adopted by Lord Aberdeen in the correspondence between the two Powers which ensued on the cession of Sarawak in 1839 to Rajah Brooke. The attitude of the British Government was even more manifest when in 1846 the Sultan of Brunei ceded to the British Government the island of Labuan, which became a Crown colony. The controversy again arose in 1879, when it was proposed to grant a royal charter to the British North Borneo Company covering concessions which had been made by the Sultans of Brunei and Sulu to Baron van Overbeck and Mr. Dent, who in turn had made them over to the Company. Lords Salisbury and Granville reiterated the view of Lord

Aberdeen and the charter was granted despite Dutch protests.¹ In 1888 the territories of the Company together with those of the Rajah of Sarawak and the Sultan of Brunei were taken under the protection of the British Government, which involved their foreign affairs devolving on the British Foreign Office. In 1891 a convention was made between Great Britain and the Netherlands in which their respective territories in Borneo were delimited.²

Great Britain and Germany in New Guinea

The control established by the Company over Tidore was considered as applying also to the vassals of that State in the western half of New Guinea. The principal fiefs, however, were not on the mainland but on the islands of Waigiu, Salwatti, and Misol. To this ill-defined Dutch sovereignty the convention of August 1814 between Great Britain and Holland, which restored to the latter her colonies as they had existed in 1803, may be said to have accorded ratification.

In 1828 the Batavian Government declared that north-west New Guinea, as a dependency of Tidore, was now considered part of the Dutch East Indian colonies, and this was confirmed in 1848, at which time, however, the frontier was stated to run almost straight from Cape Bonpland to the north coast.

In November 1884, when Erskine proclaimed south-east New Guinea a British protectorate, the meridian of 141° E. long. was acknowledged as the frontier between British and Dutch territory. Later, in a treaty between Great Britain and Germany (1885) and in the *Schutzbrieif* given to the New Guinea Company by the Emperor William I, the same meridian from the north to the south coast was accepted as the frontier between Dutch territory and those of Great Britain and Germany.

In July 1895 in a convention entered into by Great Britain and Holland the boundary between their respective territories was described. By this time it had altered slightly. From the intersection of the boundary between British territory and German it follows the line of 141° E. until it intersects the

¹ Spanish pretensions to the territories in Borneo of the Sultan of Sulu were given up in 1885.

² The boundary between the territory of the British North Borneo Company and that of the Dutch adjoining was surveyed in 1912 by a joint commission.

Fly River, which it then follows to the point where the river intersects the line $141^{\circ} 1' 47.9''$. This it follows southwards to the middle of the mouth of the Beusbach River on the south coast. The navigation of the Fly River, except for the carriage of munitions of war, is free to the subjects of both contracting Powers.

Portugal

The struggle between the Dutch and the Portuguese in the seventeenth century resulted in the gradual exclusion of the latter from the archipelago until the only foothold remaining to them was in Timor and the neighbouring islands. Their earlier relations with the Dutch have been dealt with on p. 519. On their restoration by the Convention of August 1814 between England and Holland the Dutch, in 1818, officially reiterated their claim to the western half of Timor. But as yet no attempt had been made to delimit frontiers, and there occurred a series of 'frontier incidents' involving native tribes, probably instigated thereto in some cases by the rival European authorities. To remedy this state of affairs the Dutch made an offer to buy out Portuguese rights, but this was refused, and in 1851 the action of a Portuguese commissioner in connexion with an attempt to delimit boundaries was repudiated by his Government. In 1859 (April 20) a treaty was signed in which the main boundary through the centre of the island and the subsidiary boundaries of the enclaves, claimed by both parties, were described, but without any previous survey having been made. It was not until 1893 that a convention was signed, in which it was agreed to carry out a survey of the main boundary and, if possible, to abolish enclaves. In 1898 a Boundary Commission consisting of three Dutch and three Portuguese was formed, and the plan of action agreed upon was that where there was a dispute about the track of the boundary both tracks should be surveyed and the decision left to the respective governments. The main boundary was first surveyed and then subsidiary boundaries of the enclaves. It was found necessary to make double surveys in several cases, and the task was further complicated by dissensions among native chiefs, who forcibly prevented the survey of territories in dispute between themselves. At Kupang in October 1899 the Portuguese commissioners proposed as a solution of the difficulty that the

boundary should consist of an approximately straight line following natural features, chiefly the Baikama River. This was rejected by the Dutch members, who had received instructions not to exchange certain territories. The latter now proposed the acceptance of the main boundary as surveyed and mapped, involving reciprocal concessions of territories previously in dispute. This arrangement did away with all enclaves except that of the Ocussi. The findings of the Commission were not at once accepted by the two governments, and until the Ocussi question could be settled, the settlements arranged in connexion with other territories could not be ratified. In 1902 it was agreed at the Hague that when a survey had been completed of the eastern frontier of Ocussi it would be possible to accept the findings of the Commission, except that the Ocussi enclave was kept by Portugal. Meanwhile, a treaty was made in October 1904 recording the new boundaries as far as they had been arranged, but the ratification was postponed until such time as the Ocussi survey might be carried out. This proved no easy matter. In 1909 a mixed Commission was formed, but owing to a dispute about the meaning of an article of the Treaty of 1904 the work was stopped.

The outbreak of frontier affrays in 1913 and further disagreements about the treaty induced recourse to arbitration. In June 1914 M. Lardy, a member of the Hague Court of Arbitration, and Swiss Plenipotentiary at Paris, decided in favour of the Dutch view of the track of the eastern frontier of the Ocussi enclave. It was now possible to carry out the Treaty of 1904. As various exchanges are recorded to have taken place in November 1916 it may be assumed that the treaty with the decision of the arbitrator is in process of being carried into effect.

The differences between the Dutch and Portuguese on Timor extended to the islands of Solor, Flores, Adunara, Lomblen, Pantar, and Alor (Ombay). From the beginning of their relationship the Portuguese laid claim to certain parts of Flores, Adunara, and Solor. This claim was admitted by a Dutch commissioner in 1818. In the middle of the century the controversy was re-opened. A treaty was therefore negotiated by which the position of the islands was definitely settled, and this treaty was ratified in 1859. By this treaty Portugal definitely ceded the kingdoms of Larantuka, Sika, Paga, and their

dependencies in Flores, the kingdom of Woure in Adunara, and the kingdom of Pamankaju in Solor, besides abandoning pretensions of a vague kind to all other States in the above-mentioned islands and in the islands of Lomblen, Pantar, and Alor. The eighth article of the treaty confirmed Holland in entire possession of all islands north of Timor—to wit, Flores, Adunara, Solor, Lomblen, Pantar, and Alor, with the small islands belonging to the Solor archipelago. The ninth article states that as compensation for the cession of the above islands Portugal was to be remitted certain debts owed to the Netherlands Government.

Present Situation

An interesting expression of opinion is that of the State Commission which, in 1913, issued a report on the defences of Netherlands India. Brief reference was made to the situation as it had developed during the previous thirty years ; Germany had become a colonial power with territory in New Guinea ; Japan had acquired Formosa, and America the Philippines, while Holland herself had considerably extended her sway in the Malay Archipelago. Further, Japan had become one of the great Powers, Australia was making vigorous progress, and, more recently, there had arisen the possibilities attaching to a republican China. Of importance also were the various combinations of Powers expressed in the Anglo-Japanese Convention of 1905, the Franco-Japanese Treaty of 1907, the Treaty of 1909 between Japan and America, and the Russo-Japanese Treaty.

After expressing some anxiety as to the prospect of a European war it was agreed that the only policy for Holland in the Indies was that of strict neutrality secured by the favourable treatment without partiality of all foreigners and foreign capital. Although it was recognized that Netherlands India could not withstand the attack of a great Power, the commissioners recommended the strengthening of the defences of the colony to a point at which they would be able to deal with immediate dangers and constitute a formidable support to a friendly Power interested in the maintenance of the *status quo* in the East.

This policy has been advocated as recently as December 16, 1917, by the pacifist Dutch newspaper *Nieuws van den Dag*,

which discusses the anxiety manifest in Dutch opinion since the beginning of the war as to the safety of the Indies. The danger is thought to come from Japan, and while some Dutchmen are said to accept the annexation of their colony as inevitable, others recommend the fullest naval and military preparations. The view of the newspaper is that the defences of the colony would be able to stave off invasion by Japan until Holland should be able to secure a powerful ally. It regards, however, the aggrandisement of Japan in the German and Russian spheres in China as averting the danger, and offering an opportunity of initiating a policy of friendship with the Japanese.

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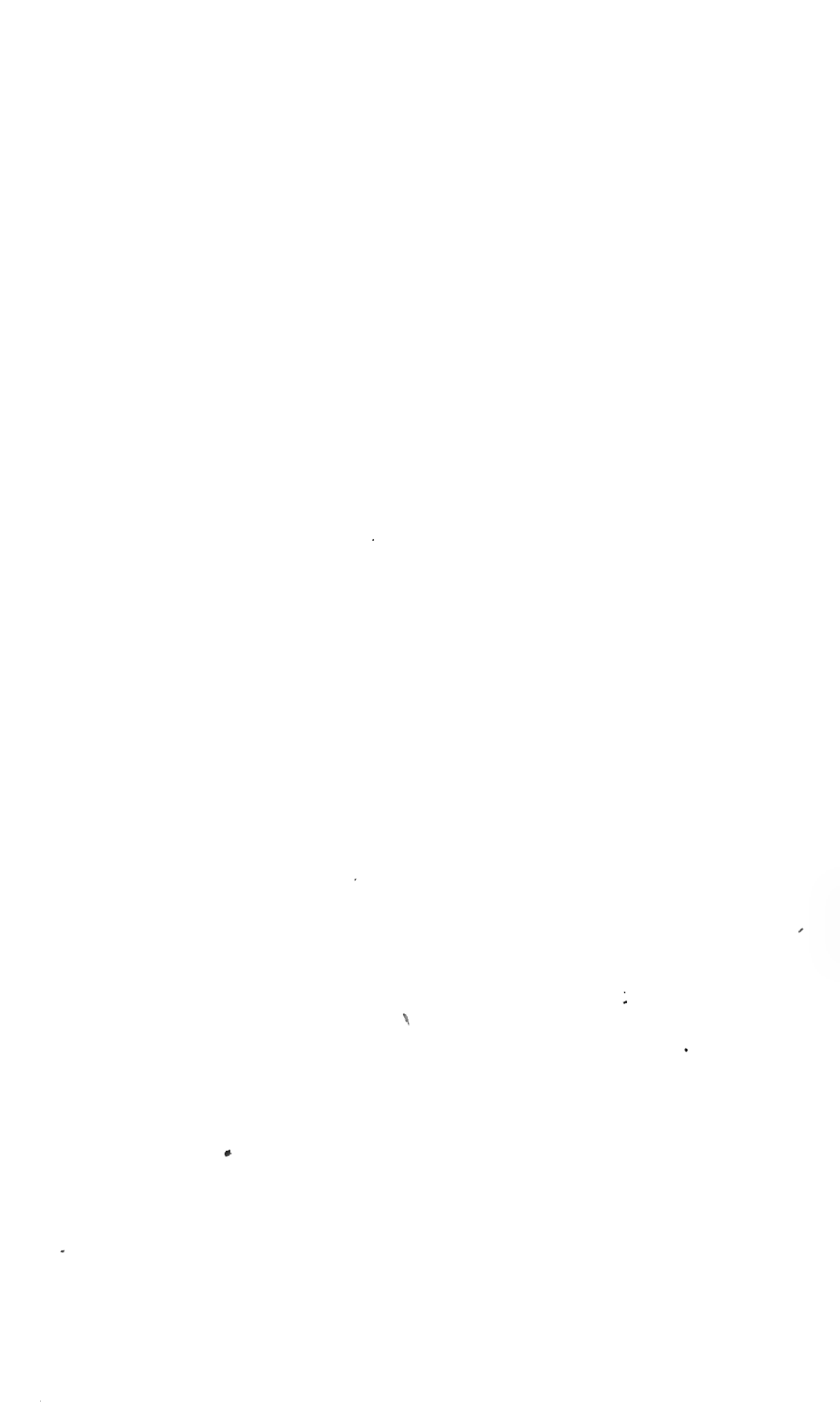
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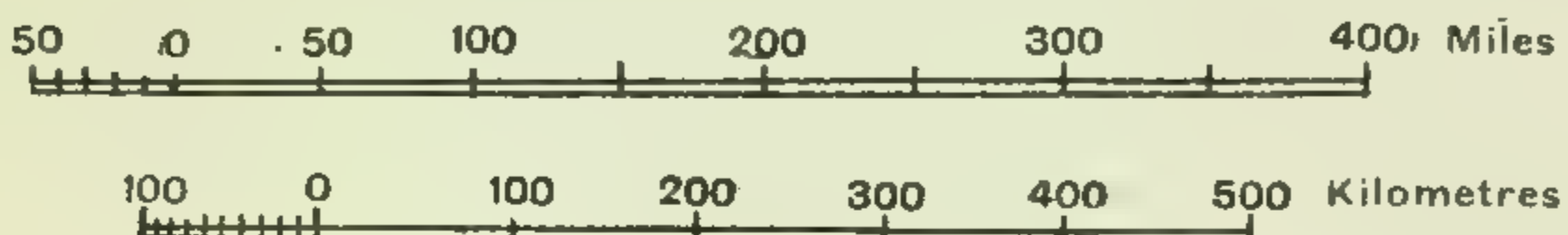
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